2011 University of Arkansas at Pine Bluff Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The School of Agriculture, Fisheries and Human Sciences administers the1890 research and Extension programs at the University of Arkansas at Pine Bluff (UAPB). The School consists of three academic departments, Agriculture, Fisheries and Human Science. Federal, state and private funds of more than $14 million supported sixty-73 ongoing projects with most of the research projects conducted at the UAPB campus site, with some activities occurring at the UAPB Lonoke and Marianna farm sites. Additional studies were conducted on cooperating farm sites in Jefferson, Lee, St. Francis, Monroe and Phillips counties and with other institutions such as the Felsenthal National Wildlife Refuge.

Faculty submitted external grant proposals which resulted in twenty-two newly funded projects that added $2.45 million in funding to support Research and Extension activities. A new Evans-Allen research projects were approved and four Evans-Allen projects were completed. The knowledge gained by these research activities were extended to families and communities through a variety of outreach and Extension programs. The extension program has structured programs in 29 counties with staff housed in 10 counties.

Research and Extension in Agriculture are conducted in the areas of plant science, animal science and agricultural economics. The efforts in the Department of Human Science are directed toward human nutrition, food safety and family life. A new project is being developed in the textiles program which includes the development of new end use applications for biomaterials including traditional fibers and new modified regenerated proteins like spider silk and cellulosic fibers in relation to aspects of sustainability of materials.

The Agriculture and Human Science components of the Research and Extension programs are designed to provide information and assistance to small-scale and limited resource farmers and disadvantaged families and youth. The Aquaculture/Fisheries program supports both the state's aquaculture industry and recreational fishing as an avenue for enhancing tourism as an economic engine for the state. Research and Extension in Agriculture are conducted in the areas of plant science, animal science and agricultural economics. The efforts in the Department of Human Science are directed toward human nutrition, food safety, family life and textiles.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	23.5	0.0	21.3
Actual	0.0	15.8	0.0	11.7

II. Merit Review Process

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

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

2. Brief Explanation

Our research and Extension programs are monitored annually through a performance appraisal system that assures adherence to planned goals. Each department in the school of Agriculture, Fisheries and Human Sciences has an internal peer review system that evaluates research proposals prior to their implementation. A peer review panel process is in place to review extension publications and internal research publications.

The Merit Review Process in SAFHS resulted in review of over 23 published papers and nine manuscripts accepted for publication. The University has also been granted permission by the Arkansas Higher Education Coordinating Board to offer a Ph.D. in Aquaculture/Fisheries. The Ph.D. program received its final accreditation review by the Higher Learning Commission during fall 2011. The new Ph.D. program accepted its first student for enrollment in January 2012. The UAPB Aquaculture/Fisheries Center of Excellence is a key partner of the aquaculture industry and natural resource managers in Arkansas.

External review of the Agriculture Department was conducted during the fall 2011. One of the suggestions for the review was that the Department should develop an advisory board for review of academic programs. Although there is an advisory board for research and Extension program, none exists for academic programs. The Regulatory Science Program which is a component of the Agriculture Department, is scheduled for external review in the fall of 2012.

The Department of Human Sciences have planned an accreditation self-study for the Council for Accreditation of the American Association of Family and Consumer Sciences, the results of which will not be known until November 2012. A self-study for accreditation for Dietetics Education was completed and the program received candidacy for accreditation; the child development center was re-accredited by the Arkansas Department of Human Services/Division of Child care and Early Childhood during 2011.

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 individuals

Brief explanation.

The Research Director/Dean of the School of Agriculture, Fisheries and Human Sciences was made permanent in September 2012. The Director used the formal stakeholder input developed by the Agriculture Research & Extension Council and the Aquaculture-Fisheries Center of Excellence Advisory Committee as external advisors for the School's extension and research programs. He also evaluated the makeup of these two stakeholder groups for effectiveness in the input process. Both stakeholder groups are providing meaningful suggestions for programmatic improvements. This past

year, the Agriculture Research and Extension Council met twice and received input from stakeholders.

The UAPB Aquaculture/Fisheries Center (AFC) recieves input and interacts with stakeholders on an almost daily basis with personnel in the Center. Individual farmers, representatives of trade associations, and board members interact frequently with Center Researchers and Extension specialists. The interaction often is initiated with a request for some specific type of information. The specific questions often expand into broader discussions as the state of knowledge in particular areas through which additional research needs become readily apparent. For the natural fisheries research and Extension areas, the primary stakeholder defined for the UAPB Aquaculture/Fisheries Center is the Arkansas Game and Fish Commission (AGFC). The increased interaction with the Arkansas Game and Fish Commission in recent years has facilitated greater communications. Formal input is obtained through the representation of the Arkansas Game and Fish Commission on UAPB'S National Aquaculture/Fisheries Advisory Council. Additional opportunities for interaction and input are available at the statewide meeting of the Arkansas Chapter of the American Fisheries Society (AFS). Many AGFC managers and biologists attend these meetings. Also, the increasing involvement of Center scientists on committees of the Southern Division of the AFS and at the national level provide opportunities for additional input because a number of AGFC personnel continue to be active in those settings.

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
- Open Listening Sessions
- Use Surveys

Brief explanation.

Stakeholder input is a core component of all 1890 research and Extension programs. Means for acquiring input varies depending upon the nature of the research or Extension program and the diversity of relevant stakeholders. These include local and state agencies, community groups, producers and other targeted audiences, as well as business and industry groups. Producer meetings, advisory groups, conferences, and focus group discussions are major means for gaining input. Our stakeholder input process is structured individually by departments/schools to represent the differences in audiences served. This approach is taken because the clientele's needs for research and Extension assistance in programs other than aquaculture are broad in scope, local in nature and geographically limited. While the Aquaculture Program provides research and Extension support for all aquaculture producers in the state, other programs support under-served and diverse audiences.

The Agriculture Research and Extension Advisory Council (AREAC)

The AREAC was originally organized in 2003 to add structure to the stakeholder input process for Research and Extension programs in agriculture. The Council formally meets once a year, but members have recently requested at least two meetings each year. Members are also in continuous contact with research and Extension faculty and administrators on a less formal basis. The AREAC was re-organized in 2010 with only slight changes in the membership structure that would allow the Council to be more responsive to the research and Extension needs of the Agriculture and Human Sciences Departments. Members will serve on the Counsel on a three year rotating basis. Membership includes seven (7) producers engaged in a variety of agricultural enterprises (i.e. alternative crops, row crops, livestock, etc.) two (2) current and retired Extension

professionals (one from 1890 and one from 1862) two (2) federal agency (NRCS, FSA) representatives, four state agency (Arkansas Department of Environmental Quality, Rural Development, Arkansas Land and Farm Development, and Arkansas Natural Resources Commission) representatives and two (2) industry (Monsanto, Delta Yams) representatives. The broad based representation of Council membership provides a broadened perspective of challenges facing producers and promotes the creation of partnerships to address the challenges.

The Aquaculture-Fisheries Center of Excellence Advisory Committee

The primary advisory committee that provides feedback and input into the UAPB Aquaculture/Fisheries Program is the National Aquaculture/Fisheries Advisory Council. It includes representation from catfish, baitfish, and sportfish farms, feed mills, Arkansas Game and Fish Commission, U.S. Fish and Wildlife Service, and other state university programs. Some committee members also serve as representatives for other state and national aquaculture industry organizations, so that these individuals contribute a much broader perspective to advisory committee meetings than their formal capacity might otherwise suggest. At the 2011 Advisory Committe meeting, recommendations included continued work on new feed formulations, marketing structures, cash flow and financial management, diseases, new chemicals approved for non-food fish, new hatchery techniques for public stocking programs, and more training for AGFC biologists. The Chicot County Extension programs derive their input from this committee's advice. Lonoke County gain stakeholder input into program development from these meetings. The Lonoke County Agricultural Office, operating as part of the 1862 State Extension Service also hosts an annual advisory committee meeting. UAPB Aquaculture/Fisheries Center staff is invited to participate in these meetings to facilitate information transfer between the 1890 Cooperative Extension Program, the 1862 State Extension Service and industry members.

In addition to the National Fisheries Advisory Council, there are a number of advisory subcommittees that specialize in specific areas and meet regularly to contribute towards the Aquaculture/Fisheries Center's program planning and development. These include the UAPB Facilities Subcommittee, the Catfish Subcommittee, and the Lonoke Aquaculture Subcommittee. Members of the Facilities Subcommittee meet on a regular basis to plan UAPB Aquaculture/Fisheries Center facility expansion and develop resources for new facilities. The Catfish Subcommittee meets twice a year and the Lonoke Aquaculture Subcommittee meets once a year to plan the annual UAPB Lonoke Aquaculture workshop, which is primarily focused on bait and ornamental fish aquaculture.

The Young Scholars Advisory Committee Structure

A Young Scholars Task Force, including some of the children and parents enrolled in the program, oversees the planning, implementation and evaluation of the program in both counties. One of the children serves as chair of the task force while another child serves as secretary. In addition to program parents and children, membership includes representatives of partnering agencies, governmental, officials, and state legislators. Our specialists in agriculture, family and community programs work with 1862 county agents, as requested, to organize clientele groups through community-based organizations, schools and the faith-based community. Both research and Extension programs in Aquaculture/Fisheries and in Agriculture and the Family and Consumer Sciences Extension program utilize an advisory committee structure as a major component of the stakeholder input process. The Human Sciences Research program employs other mechanisms to obtain stakeholder input.

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

Brief explanation.

Informal input from stakeholders is presented and discussed at formal meetings with research faculty and staff. Strategies are developed to address identified concerns as appropriate. Faculty are represented on all structured committees for purposes of participating in the discussion and gathering the input from stakeholders that will later be presented back to faculty and staff. An example of input from a structured committee currently being implemented is an evaluation of fall green planting dates initiative in 2011 and plans to develop and install a commercial kitchen for evaluation of value added processing of vegetables and fruit.

The most recent stakeholder meeting resulted in suggestions by the group for conducting research that will provide a foundation for introducing additional herbicides for use in sweetpotato production. Both graduate research projects and a faculty research program have been developed to address this stakeholder issue. Conversely, an individual stakeholder suggested that the research we currently conduct with straight head disease in rice was not important for our clientele. This is an instance where the Director must weigh the comments of the individual with the needs of the overall state and other agricultural clientele. Other suggestions included holding additional meetings each year during Agriculture Field Days, and taking care not to shift a disproportionate amount of the attention to the new foundation sweetpotato seed program to the detriment of other 1890 agricultural programs.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- In the Action Plans
- To Set Priorities

Brief explanation.

The input from stakeholders has been incorporated into outreach efforts with sweetpotato outreach programs and enhanced technical support for value-added processing with various agricultural commodities. The most recent stakeholder meeting resulted in suggestions by the group for conducting research that will provide a foundation for introducing additional herbicides for use in sweetpotato production. Both graduate research projects and faculty research programs have been developed to address this stakeholder issue.

Brief Explanation of what you learned from your Stakeholders

Input from stakeholders through the agricultural Extension agents and program assistants in the field continue to play a major part in program development. The group of farmers and packing house operators continue to voice the need to support the growing sweet potato production in Arkansas. Sweet potato research was expanded in the area of product development and the

Extension program has given increased attention to farmer production problems.

The Aquaculture-Fisheries Advisory Committee continues to give input for the research and Extension programs. This year the Committee focused on the continued development of the Ph.D. program in Aquaculture-Fisheries and the economic plight of producers in the region. The Committee strongly supported the development of this graduate program because of the direct impact it would have on the research and Extension.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	1850666	0	2254037

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	1845580	0	2374447
Actual Matching	0	1564847	0	1881934
Actual All Other	0	0	0	0
Total Actual Expended	0	3410427	0	4256381

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	257937	0	335124

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Families, Youth, 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
802	Human Development and Family Well-Being		45%		100%
806	Youth Development		55%		0%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	1.2	0.0	0.4
Actual Paid Professional	0.0	1.0	0.0	0.4
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	285890	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	265846	0	28265
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

Two focused areas were addressed in the 1890 Family and Child Development Program. These

included ***Teens on the Go*** *and the* ***Young Scholars Program***. ***Teens on the Go*** is a newsletter that was developed for students in grades 7-12. Students received 6 issues of the newsletter during the school year. The issues included: 1) Shoplifting: The High Price of Pilfering!; 2) Drinking and Driving--"It's Suicide;" 3) The Toll of AIDS; 4) Anger: How to Cool It!; 5) Recognizing an Abusive Relationship; and 6) The Tough Life of a Teen Mom. The ***Young Scholars Program*** was implemented in a housing project in Brinkley. The children, referred to as ***Young Scholars***, met 5 days a week in an after-school program that emphasized math and science skills. Parents enrolled in the ***Young Scholars Program*** met in small groups weekly and focused on the curriculum for the children as well as on parenting education, stress management, coping and job related skills, family relationships, and economic-and self-sufficiency skills. Two research assistants were hired and interviewed 100 childcare directors, teachers and parents in Southeast Arkansas regarding their perception of quality in childcare centers. Data from the research project, **Predictors of Quality in Early Childhood Programs**, were analyzed and an observation was conducted in those centers indicating an interest in national accreditation. Findings indicated that directors, teachers and parents revealed a number of quality issues that should be addressed when additional funds are available.

2. Brief description of the target audience

The target audiences for these programs included students in grades 7-12 (**Teens on the Go**); low-income children and their families who live in a housing project (**Young Scholars Program**); family home, Head Start and daycare center directors, their staff, and enrolled children, and parents in Southeast Arkansas (**Predictors of Quality in Early Childhood Programs**).

3. How was eXtension used?

Many eXtension resources were used in some of the programs.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	212	55	54	60000

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- The number of participants in these programs will include direct and indirect contacts with youth and adults.

Year	Actual
2011	60321

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	To increase the understanding of agriculture, math, science, engineering,food, and environment among elementary and secondary school students;increase performance in school, help students develop decision-making skills, avoid becoming dropouts,help participants gain knowledge in resource management/financial planning; help families gain economic security and improve quality in early childood education programs, and gain skills for helping their children achieve their full potential.

Outcome #1

1. Outcome Measures

To increase the understanding of agriculture, math, science, engineering,food, and environment among elementary and secondary school students;increase performance in school, help students develop decision-making skills, avoid becoming dropouts,help participants gain knowledge in resource management/financial planning; help families gain economic security and improve quality in early childood education programs, and gain skills for helping their children achieve their full potential.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	60321

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Policy makers, educators and the public in general continue to be concerened about the American family. In Arkansas nearly 7.6 percent of children live in communities that have been labeled severly distressed with high numbers of unemployment, high school dropouts and teenage pregnancies. Experts perdict that many of these children have great odds to overcome.

What has been done
A newsletter, Teens on the G0, was developed 33 years ago to teach decision-making skills to students in grades 7-12. A Young Scholars Program was implemented 16 years ago to teach math and science skills to minority children living in a housiing project. The Young Scholars Program reaches the entire family and parents are enrolled in the program. The research project interviewed 166 childcare directors, teachers and parents regarding their perception of quality in early childcare programs.

Results
Total contacts with Teens on the Go, the newsletter for 7-12 grade students were 60000. One student said: "Teens on the Go helps me deal with situations in school and life. I have learned ways to defuse difficult situations." The Young Scholars Program is noted for helping low-income minority children improve school performance and graduate from high school. Twenty former Young Scholars are currently enrolled in a community college or a four year institution. The research project, Predictors of Quality in Early Childhood Programs interviewed 166 childcare directors, teachers and parents and analyzed the data.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economy continues to be of concern. Many families in the Brinkley area lost jobs and moved from the projects which had an impact on the enrollment of the program.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Students in grades 7-12 continue to praise Teens on the Go as helping them to make good decisions. Teens on the Go is in its 33rd year of implemation.Total contacts with Arkansas teens this reporting period were 60000. In the Young Scholars Program twenty former students are either attending a community college or a four-year institution. Forty-two percent of children in the Young Scholars Program had an increase in school performance. Thirty -three percent of parents in the Young scholars Program reported meeting monthly financial obligations. Findings in the research project indicated that parents, directors and teachers identified quality practices in early childhood programs in Southeast Arkansas that would improve programs if funding were available.

Key Items of Evaluation

Teens on the Go is in its 33rd year of implementaion. Total contacts with Arkansas' 7-12 grade students were 60000. Topics included: 1) Shoplifting: The High Price of Pilfering; 2) Drinking and Driving--"It's Suicide;" 3) The Toll of AIDS; 4) Anger: How to Cool It!; 5) Recognizing an Abusive Relationship; and 6) The Tough Life of a Teen Mom.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies		25%		25%
502	New and Improved Food Products		25%		25%
503	Quality Maintenance in Storing and Marketing Food Products		25%		25%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins		25%		25%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.3	0.0	0.7
Actual Paid Professional	0.0	0.4	0.0	0.8
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	79237	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	33799
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

Fresh-cut sweetpotatoes (Ipomoea batatas) was treated with edible coating and sanitizer to evaluate shelf-life extension and quality preservation. Sweetpotatoes were hand peeled and sliced. Hydroxy propyl methyl cellulose (HPMC) (1 %) (Methocel®) and chitosan (1%) were prepared as edible coating solution. Sodium hypochlorite solution (100 ppm) and peroxyacetic/octanoic acid mixture (POAA/OA, Tsunami 200, 40 ppm) were prepared as sanitizer solution. Treated samples were placed in PD 900 for modified atmosphere packaging and PD 941 bags for air packaging. The PD 900 bags were flushed with gas mixture composed of 4/5% (O_2/CO_2) with a nitrogen balance. The PD 941 bags were heat sealed. Samples in bags were stored in the refrigerator at 4°C. Samples were taken from the refrigerator at 0, 4, 7, 11 and 14 days. The headspaces of $O_2$and CO_2were checked. Aerobic plate counts were determined.

2. Brief description of the target audience

Local farmers and limited resource farmers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	25	5	0	0

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

Patent Applications Submitted

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Three abstracts and three presentations at the scientific annual meetings. Three peer reviewed publications. Three presentations and/or workshops to farmers.

Year	Actual
2011	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase number of small farmers and producers who adopt UAPB's Fresh-Cut Processing Technology and utilize it for their fresh-cut process. The target of 40 was to high. 10 is a better target.

Outcome #1

1. Outcome Measures

Increase number of small farmers and producers who adopt UAPB's Fresh-Cut Processing Technology and utilize it for their fresh-cut process. The target of 40 was to high. 10 is a better target.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	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
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

Brief Explanation

No natural disasters affected outcomes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The initial aerobic plate counts of fresh cut sweet potatoes treated and untreated were about 3.0 log CFU/g and gradually increased to 7.0 to 8.0 log CFU/g after 14 days of refrigerated storage. The aerobic plate count of chitosan coated sweet potatoes were lower more than 2 logs up to 7 day storage than other treated sweet potatoes. Eventually, the aerobic plate counts of all samples reached 7.0 to 8.0 log CFU/g after 14 day storage.

Key Items of Evaluation

Modified atmosphere packaging did not give significant influence on microbiological quality of fresh-cut sweet potatoes regardless of edible coating or sanitizer treatment. Chitosan coating is very promising to inhibit the growth of microbial population. HPMC coating was the most effective in maintaining visual freshness during 14 day of refrigerated storage. Further study is necessary to focus on HPMC coating containing natural antimicrobials to enhance microbiological quality of fresh cut produce.

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V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water		20%		20%
112	Watershed Protection and Management		20%		15%
133	Pollution Prevention and Mitigation		15%		20%
134	Outdoor Recreation		10%		10%
204	Plant Product Quality and Utility (Preharvest)		20%		15%
403	Waste Disposal, Recycling, and Reuse		15%		20%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.5	0.0	0.5
Actual Paid Professional	0.0	1.6	0.0	1.1
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	205612	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	55552	0	144566
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

The long-term effectiveness of a swine waste treatment lagoon was assessed by monitoring the water quality of the treatment lagoon on a weekly basis during the spring and summer months. The mean phosphorus concentration at the lagoon surface was 11.54 mg/L, with a standard deviation of 5.93 mg/L. Total nitrogen had a mean of 4.50 mg/L, with a standard deviation of 2.10 mg/L. Nitrate had a mean of 0.89 mg/L, with a standard deviation of 0.67 mg/L. Nitrite had a mean of 0.52 mg/L, with a standard deviation of 0.0.57 mg/L. Ammonia had a mean of 1.32 mg/L, with a standard deviation of 0.87 mg/L. The mean phosphorus concentration (at the surface) found for the same time period in chamber 1 (treatment wetland) of the constructed wetland was 2.45 mg/L, with a standard deviation of 1.66 mg/L. Total nitrogen mean was 2.29 mg/L, with a standard deviation of 1.34 mg/L. Nitrate mean was 0.34 mg/L, with a standard deviation of 0.33 mg/L. The nitrite mean was 0.28 mg/L, with a standard deviation of 0.32 mg/L. Ammonia mean was 0.37 mg/L, with a standard deviation of 0.35 mg/L. All nutrients sampled from wetland chamber 1 were reduced when compared to the nutrient levels in the lagoon. Personnel associated with this program were able to present the research and demonstration findings at several conferences and at the UAPB Farm Field day where over 200 individuals received abstracts and a short presentation. Those in attendance at the most recent field day responded that the project or some aspect of it most interested them during visit. Over 90 elementary school children toured the facility and were exposed to farm animals and dealing with animal waste.

In 2011 the following work was completed and published: beginning and ending water quality measurements associated with swine waste treatment lagoon were collected; beginning and ending water quality measurements associated with constructed wetland cells and varied aquatic plants were collected; water quality measurements associated with the UAPB Demonstration Farm pond were collected. The following work was completed is on-going: information regarding swine waste Treatment System was disseminated; the number of small, local and limited resource farmers that have been assisted with swine waste treatment, odor and/or water quality issues each year was documented, and hill-slope runoff model output for the farm watershed using the a hill-slop runoff predictor (similar to EPIC) is in the process of being completed.

Arkansas has a large number of small impoundments that serve as sources of food and recreation. Many of these water bodies are old, and have experienced sedimentation and nutrient enrichment, resulting in increased aquatic vegetation problems. Warmer weather has increased the northern range of several problematic aquatic weeds. Information on managing these resources was disseminated directly to the general public, through county offices, and through natural resource agencies. Proper identification of problematic aquatic plants is essential, and this service is provided to the general public. Activities include direct contacts with the general public, indirect contacts through county extension faculty, fact sheets, freshwater aquaculture eXtension content, newsletter articles and presentations at meetings and workshops. Radio interviews reached a wider audience across rural America. A wide variety of educational activities are utilized in this program, however, reaching a major segment of the target audience still requires individual contact for effective implementation.

In 2011, further research was conducted on controlling nuisance submersed vegetation in baitfish culture ponds. The aquatic herbicide fluridone, at a rate of 5 ppb, was added to ponds at the time of their filling and plant growth was monitored. Research was conducted in the Gulf of Mexico to determine the effect of urban development on water quality and aquatic ecosystem health.

The primary goal of the Arkansas River largemouth bass work is to evaluate differences in wild age-0 largemouth bass mortality, growth, and condition when small, closed aquatic systems are stocked with varying densities of age-0 hatchery-reared largemouth bass. Thirty small impoundments in Southeast Arkansas have been electrofished to collect age-0 largemouth bass. Peterson mark-recapture studies

have been conducted in all thirty of these ponds, so that the abundance of wild age-0 largemouth bass is known in each system. In addition, physical, biological, and chemical characteristics of the sytems were measured and observed.

This phase of the Arkansas River largemouth bass study was designed to 1) generate updated population parameters for largemouth bass, 2) examine possible relationships between bass growth and river hydrology, 3) assess the suitability of the current 381-mm (15-in), and 4) generate additional estimates of largemouth bass angler effort, catch, and harvest for other pools of the Arkansas River.

For the district and state 4-H O'Ramas, baitcasting and reel into sportfishing contests are conducted. With one of the local 4-H clubs, a fish anatomy and dissection demonstration was also conducted at the request of the local club leader.

2. Brief description of the target audience

The target audience includes but is not limited to small, limited resource landowners, underrepresented communities, and families.

The target audience is small impoundment owners, commercial fish farmers, and natural resource managers. Many of the impoundments are less than 1/2 - acre, are located in rural areas, and are owned by a broad cross-section of the general public in terms of income, education and other socio-economic factors.

Baitfish culture is a major segment of the Arkansas aquaculture industry and this research was aimed at solving one of their major problems.

Arkansas Game and Commission fisheries biologists and managers, tournament largemouth bass anglers, recreational anglers of Arkansas.

Children age 8-18 and the county agents who work with the 4-H clubs.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1010	1700	155	150

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	3	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Complete one peer reviewed research article every two years.

Year	Actual
2011	0

Output #2

Output Measure

- Document the number of small, local and limited resource farmers that have been assisted with swine waste treatment, odor and/or water quality issues each year.

Year	Actual
2011	5

Output #3

Output Measure

- Complete one fact sheet regarding water quality, swine waste management or environmental stewardship each year.

Year	Actual
2011	1

Output #4

Output Measure

- Number of project annual and final reports

Year	Actual
2011	1

Output #5

Output Measure

- Number of presenations and scientific meetings

Year	Actual
2011	2

Output #6

Output Measure

- Number of abstracts published

Year	Actual
2011	13

Output #7

Output Measure

- Number of refereed journal articles

Year	Actual
2011	2

Output #8

Output Measure

- Number of research reports submitted to stakeholders

Year	Actual
2011	0

Output #9

Output Measure

- Number of non-peer reviewed pubications

Year	Actual
2011	2

Output #10

Output Measure

- Number of presentations at both local community meetings and national scientific meetings

Year	Actual
2011	27

Output #11

Output Measure

- Number of small or limited resource farmers assisted by project

Year	Actual
2011	55

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	The number of conservation practices utilized by swine farmers as a result of this project is an outcome measure.
2	Increase awareness of environmental issues and policies that pertain to operating small swine farms.
3	Number of research recommendations transferred to AGFC staff
4	Increase in ponds that are designed, stocked, and managed correctly
5	Reduced number of pond problems
6	The percent of AGFC fisheries biologists and managers that are informed about use of retenone samples for scientific research topics through scientific meetings and conferences
7	Percent of AGFC fisheries biologists and managers who use the study results to solve management issues
8	Number of tournament largemouth bass anglers that learned what we know
9	Number of recreational anglers that learned what we know
10	Number of non-agency fisheries biologists that use what we know
11	Percent reduction in complaints to the AGFC regarding largemouth bass in the Arkansas River
12	Percent increase in largemouth bass tournaments on the Arkansas River
13	Number of AGFC personnel that learned what we know
14	Number of non-agency fisheries biologists that learned what we know
15	Number of AGFC personnel that use what we know
16	Owners and managers of aquaculture ponds and reservoirs that benefited from aquatic weed cases
17	Youth education provided through extension programs

18	Effects of urban development on water quality and ecosystem health in Mississippi Bayous
19	AGFC Biologists will use information on hatchery fish influence on wild fish to inform decisions regarding stock enhancement

Outcome #1

1. Outcome Measures

The number of conservation practices utilized by swine farmers as a result of this project is an outcome measure.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Both small swine farmers and their neighboors care about water quality and odors near their property. Degraded water quality if of concern, especially if the water is contaminated with swine manure. High levels of nitrogen, phosphorus and colifom bacteria are of particular concern.

What has been done
Water quality measurements have been collected analyzed and published. A Field day has been held and a calendar was published and disseminated.

Results
Great interest has been expressed regarding swine waste treatment and the knowledge of the participants has been expanded by the conservation practices that were shared. The water quality of the swine waste treatment system was greatly improved by the treatment lagoon and the constructed wetland. The field day generated a great deal of interest in the swine waste treatment system among the participants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
204	Plant Product Quality and Utility (Preharvest)
403	Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

Increase awareness of environmental issues and policies that pertain to operating small swine farms.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Agricultural and natural resource professionals as well as landowners and livestock farmers care deeply about this issue. They are concerned about the resource both as a means of livelihood for producers and as an inheritance.

What has been done
Both the swine waste treatment system has been demonstrated and related information has been shared at field days and tour groups.

Results
Great interest has been expressed and a desire for additional information (knowledge) has been expressed regarding conservation practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

204	Plant Product Quality and Utility (Preharvest)
403	Waste Disposal, Recycling, and Reuse

Outcome #3

1. Outcome Measures

Number of research recommendations transferred to AGFC staff

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Increase in ponds that are designed, stocked, and managed correctly

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Reduced number of pond problems

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	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
134	Outdoor Recreation

Outcome #6

1. **Outcome Measures**

The percent of AGFC fisheries biologists and managers that are informed about use of retenone samples for scientific research topics through scientific meetings and conferences

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Percent of AGFC fisheries biologists and managers who use the study results to solve management issues

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of tournament largemouth bass anglers that learned what we know

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of recreational anglers that learned what we know

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of non-agency fisheries biologists that use what we know

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Percent reduction in complaints to the AGFC regarding largemouth bass in the Arkansas River

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Percent increase in largemouth bass tournaments on the Arkansas River

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Number of AGFC personnel that learned what we know

Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

Number of non-agency fisheries biologists that learned what we know

Not Reporting on this Outcome Measure

Outcome #15

1. **Outcome Measures**

Number of AGFC personnel that use what we know

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

Owners and managers of aquaculture ponds and reservoirs that benefited from aquatic weed cases

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Arkansas has over 60,000 acres of aquaculture ponds and over 300,000 ponds and reservoirs. A major problem for the owners and manager of these water bodies is management and control of aquatic plants. Furthermore, infestation by aquatic vegetation causes problems on thousands of cattle watering ponds, and roadside and irrigation ditches. In order to use seines to harvest commercial ponds, producers want to eliminate certain aquatic plants (with the exception of plankton). Other pond owners often want to eliminate certain aquatic plants and not others, for practical and aesthetic reasons. Misinformation and confusion leads to wasted money and effort, and poor management of aquatic plants.

Submersed aquatic vegetation growth is a major issue for the Arkansas baitfish industry. The profit margin on baitfish ponds is always low and nuisance vegetation can, at times, make it more cost efficient to not harvest a minnow crop. Cheaper control methods and techniques are a high research priority for the industry.

What has been done
Over the past year, we fielded more than 800 telephone enquiries and requests for assistance, both directly and indirectly, from aquaculture producers, pond managers, District Biologists, Park Superintendents and hatchery managers for the Arkansas Game and Fish Commission, and University of Arkansas Cooperative Extension Agents.

For the past two years, increasingly lower rates of the aquatic herbicide fluridone have been used. The herbicide is added at the time of pond filling to act as a submersed aquatic plant pre-emergent herbicide to suppress plant growth and allow a phytoplankton "bloom" to become established.

Results
Our efforts have resulted in more cost-effective control of aquatic plants and greater enjoyment of farm ponds

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

Outcome #17

1. Outcome Measures

Youth education provided through extension programs

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Involving youth in fishing has the potential to increase the customer base for the state baitfish industry.

What has been done
The extension contest fact sheets have been updated and the county agents were informed of the help Extension specialists can provide for their county programs.

Results
County agents and farm pond owners had access to more comprehensive information on aquatic weed control than previously.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

Outcome #18

1. Outcome Measures

Effects of urban development on water quality and ecosystem health in Mississippi Bayous

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Human activities especially urban development can largely affect water quality and aquatic ecosystem health. Urban sprawl is one of the biggest issues in the Northern Gulf of Mexico.

What has been done
Seine pulls of fish community investigations were conducted quarterly in two stations in each bayou and samples were sorted to species, counted for richness estimates, and measured with digital calipers.

Results
With increasing anthropogenic impacts, abundance and dominance of fish species tend to shift from specialized individuals requiring specific habitat, water quality, and diet needs (e.g., Anchoa mitchilli) to more generalist species that can survive less than optimal (e.g., Fundulus spp., Poecilia latipinna, and Eucinostomus argenteus). Significantly (P , 0.05) higher fish diversity indices in the urbanized Bayou Chico (mean ± S.D. = 1.2 ± 0.555) than that in the pristine Bayou Heron (0.264 ± 0.338) were observed. However, fish diversity in the moderately urbanized Bayou Cumbest was not statistically different from either (0.85 ± 0.577). Seasonal variations in fish diversity within bayous were also observed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

Outcome #19

1. Outcome Measures

AGFC Biologists will use information on hatchery fish influence on wild fish to inform decisions regarding stock enhancement

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Largemouth bass Micropterus salmoides are among the most popular sport fishes in the United States. Assessment of the AGFC largemouth bas stocking programs is challenged by the absence of measurable stocking objectives. It is uncertain what effect, if any, stocking has on wild largemouth bass. Stocked fish often contributed significantly to the age-0 year-class. But, in some studies, fish recruited poorly to the fishery. Most studies have not documented whether hatchery fish increased total abundance, or replaced wild fish through compensatory mortality.

What has been done
Thirty small impoundments in Southeast Arkansas were divided into a control group (no hatchery fish stocked), a low stocking density (60 fish/ha) group, and a high density stocking density (238 fish/ha) group. Largemouth bass were freezed-branded prior to stocking to allow distinction between hatchery and wild fish. We are currently assessing the proportion of the age-0 group comprised of hatchery fish. This will continue until next summer, when the growth, condition, and survival rates of wild fish will be compared among the treatment and control ponds.

Results
This an an ongoing study and results will not be available until 2012.

4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes

Brief Explanation

The slow economy has affected rural areas of the state as well, and pond owners are seeking economical control meaures for problematic aquatic vegetation. Unfortunately, herbicides approved for aquatic use are generally very expensive very expensive relative to terrestrial herbicides, and homeowners are tempted to use unapproved compounds. Our educational programs have stressed biological control methods, the importance of following the label, and preventing measures to reduce nutrient inputs.

Temperature and sunlight will impact the use of a herbicide as a pre-emergent. If it is unusually cool, it might take longer for the phytoplankton bloom to become established. It this happens, then repeated herbicide treatments might be needed.

Political, public relations, and economic factors are involved in almost any management adopted by AGFC. Although all research is ultimately done to serve public interests, AGFC manages fisheries for the state of Arkansas, thus, we do not deliver our research or recommendations directly to the public. Dissemination of management research and other information, and eventual management actions are determined through the fisheries management process used by AGFC, of which we only affect the science component.

Recruitment for 4-H clubs occurs at the county level and is entirely outside the control of the Extension Specialist. Demographic changes where more children are raised in environments where 4-H may seem relevant to their lives can impact club recruitment.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

County agriculture extension agents across Arkansas were surveyed using a web-based service regarding pond management and aquatic plant control needs. The top farm pond problem was aquatic weeds, followed by algae problems. Agents requested more training and assistance on these topics (an in-service is scheduled for May 2012). A variety of types of assistance were requested, with fact sheets considered to be a very good and useful publication. In the survey, agents were asked to provide additional suggestions or comments. Agent comments included; "Good program support"; The entire UAPB staff does a wonderful job assisting county faculty with aquatic topics and issues"; and "Keep up the good work. I always get the help I need when I call you guys."

Coastal managers realized the importance of storm water discharge management and habitat protection.

It was the opinion of the farmer that the results he got from adding fluridone at a low rate at the time of pond filling were better than the traditional strategy of using herbicides

to control a problem weed after it becomes established.

A census was conducted of relevant AGFC fisheries biologists involved with largemouth bass management in the Arkansas River.

Key Items of Evaluation

Given that our target audience for this program is scattered across the state, and many are in rural areas, program delivery is primarily through county extension faculty. A key item in evaluating the program is whether we are meeting county agents needs.

Nutrient budgets were clarified for coastal watersheds with urban development.

Money spent and man hours involved in treatment.

A census was designed to assess how useful this research was in assisting AGFC biologists and managers in solving their management issues.

Feedback from county agents.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms		5%		13%
202	Plant Genetic Resources		5%		13%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants		14%		10%
205	Plant Management Systems		15%		7%
211	Insects, Mites, and Other Arthropods Affecting Plants		6%		0%
213	Weeds Affecting Plants		10%		0%
301	Reproductive Performance of Animals		5%		5%
302	Nutrient Utilization in Animals		6%		5%
307	Animal Management Systems		0%		10%
311	Animal Diseases		12%		7%
601	Economics of Agricultural Production and Farm Management		5%		13%
602	Business Management, Finance, and Taxation		12%		0%
603	Market Economics		0%		10%
610	Domestic Policy Analysis		5%		7%
	Total		100%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	5.0	0.0	6.5
Actual Paid Professional	0.0	12.8	0.0	9.1
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
0	1225727	0	2186810
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	1203993	0	1592260
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

To help Small and Socially Disadvantaged Farmers (SSDF) utilize their small tracts of land, the University of Arkansas at Pine Bluff (UAPB) used its Extension Associates (EA) to educate SSDF about the profitable income opportunities that could be obtained by adding vegetables crops to their row crop operations. The EA provided farmers with counseling and fact sheets on the economics and production of selected vegetable crops. UAPB also worked with East Arkansas Enterprise Community (EAEC) to market vegetables through a 13000 square foot demonstration processing facility owned by the University.

EA worked directly with producers to get them to start using soil testing, nematode testing, varieties selection, and chemical weed control recommendations to increase yield. Some producers were provided with direct assistance in using the practices while other were informed indirectly about using the practices to increase yields.

Four estate planning workshops were conducted in different areas of the state. These workshops were designed to educate SSDF about the dangers of heir property and the consequences of not having an estate plan to pass the land to the next generation.

A survey has been developed by using stakeholder input from farmers to solicit pertinent information related to the small farm project participant's socioeconomic characteristics and level of participation in government programs. Data analysis from 2009 related to the level of participation of SSDF indicated that the Small Farm Project assisted 64 producers with developing financial plans that were funded in the amount of $2,818,230. A statistical analysis is still being done conducted as it relates to other study objectives. An analysis of the historical records of Small Farm Project participants is being conducted as well.

Research trials with goats and hogs on locally available alternative feeds (brewers' rice, soybeans and cotton seed hulls) continued during the period under review. Research-based recommendations were disseminated to the target audience via a farmers' workshop (12 participants were reached), a field day at UAPB (about 50 producers were reached), and farm visits (15 were made). Five small swine producers and six goat producers are implementing some of the recommendations including how to mix cheaper diets at the farm level.

The profitability of sweet potato cropping systems was compared with that of four other vegetable cropping systems for five years. Rotated and continuous cropping systems were evaluated for net returns, weeds, insects, diseases, and soil quality. Sweet potatoes tended to yield less when they were produced under continuous or rotated crop sequences. Also, sweet potato cropping systems had a higher number of weeds and reduced soil microbial activity than the other vegetable crop sequences. Management practices such as inclusion of cover crops in the cropping systems may alleviate some problems and result in improved yields. Therefore, a new project on the effect of cover crops (mustard green, rye grass, and crimson clover) on weed control and nutrient cycling in sweet potato cropping systems is being

implemented.

Prospects of Gladiolus flower production in the Southern United States is under investigation at UAPB. Research is centered on identifying genotypes that are more productive in the Southeast Region. Gladiolus flower production could be developed as a cash crop for limited-resource farmers in the region. Eight varieties of Gladiolus flower plant such as Plum Tart, Goldfield, Mixed Colors, Arabian Night, Fire-Cracker, Wigs Sensation, Pink Event, and Expresso were evaluated for flower yield at UAPB. Results indicate that the variety Expresso produces the highest number of flower but the plants require frequent irrigation during the hot summer period. It is recommended that varieties be selected for drought tolerance, vigorous growth, and early flowering. Another study was conducted to study the effect of various chemicals on vegetative growth, reproductive capacity and chemicals (anthocyanin, antioxidants, carbohydrates etc.) composition of gladiolus cultivars (American Beauty, Pacifica, and Friendship). The corms (2.6 cm in diameter) were soaked (for 6 hours) in GA3 (75 and 100 ppm) and Ethrel (100 and 200 ppm) before planting at 30 and 40 corms/m2 densities. Results show that higher plant density increases the plant height, length of flower stalk and corm yield per unit area, while it decreases the number of florets per spike, length and diameter of flower, irrespective of the treatments including control. Treatment with Ethrel inhibited plant growth but markedly increased the corm yield and the maximum corm yield. Promising results were obtained by application of ascorbic acid at 200 ppm followed by thiamine at 100 ppm on vegetative growth as well as flowering parameters. The highest recorded data were obtained in plants treated with ascorbic acid on chemical constituents such as carbohydrates, polyphenols, antioxidants and carotenoids. Postharvest vase life was studied by adding different chemicals such as MgSO4, AgNO3 and Al2(SO4)3, at either 250, 500 or 750 ppm, and sucrose at either 1, 2 or 5 % to the vase solutions. The longest spike life and superior quality for the individual flowers were obtained with AgNO3 (500 ppm) followed by MgSO4 (750 ppm). The best results were obtained by using AgNO3 (500 ppm) + 2% sucrose as a vase solution for preserving quality and increasing longevity of gladiolus spikes.

Studies have been conducted to develop new varieties of hot pepper (Capsicum annum) and bitter melon (Momordica charantia) and to determine their phyto-nutritional potentials. The objective was to identify nutritionally improved hot pepper varieties, especially for their processed food products such as hot sauces, pickles, and dry peppers for local and commercial markets. Twelve newly developed elite lines of hot pepper were selected from 66 experimental lines in 2010. These 12 lines were grown in the field in 2011 to collect pepper samples for laboratory analysis.

Nine varieties of Chinese cabbage had been planted and tested for type of carotenoids. Preliminary data of carotenoids had been obtained for some of the varieties.

The Cowpea Breeding Project evaluated four commercial varieties (Louisiana Quick Pick, Early Scarlet, Mississippi Top Pick, and Top Pick Cream) of southern peas for production of fresh peas in Southeast Arkansas. The Louisiana Quick Pick Purple Hull appeared to be the best variety for machine harvest; however, many farmers choose to use other varieties for hand harvesting due the high cost of LA Quick Pick seeds. Researchers at UAPB have developed and released two fresh pea varieties (UAPB-1 and UAPB-2). These varieties are now undergoing extensive evaluation on-farm to ascertain their stability and wide adaptation in Southeast Arkansas production environments. Large plot field trials conducted in 2011 to test suitability for mechanical harvest showed UAPB-1 and UAPB-2 to be suitable for mechanical harvesting. UAPB-1 was developed in a Modified Mass Selection procedure using the Germplasm Accession IT95K-207-15. This germplasm accession was internationally introduced from the International Institute for Tropical Agriculture (IITA) in Nigeria, West Africa (See the enclosed recommendation abstract. UAPB-1 has agronomic performance and characteristics that surpass those of most currently popular varieties grown and marketed as fresh peas. It yields about 10% higher than the four most popular currently established varieties named above. UAPB-2 is an improved selection from a cowpea Germplasm Accession "Bigbuff" acquired from the University of Limpopo in the Republic of South Africa. UAPB-2 produces cream-type seeds/peas that are acceptable, and preferred by consumers. It yields 10-15% higher the most popular varieties (LA Purple Hull, Top Pick pinkeye, Empire and Epic). An efficient regeneration system in cowpea through shoot meristem has been developed. Shoot meristems were isolated from embryos that were pre-cultured for 3-5 days on Murashige and Skoog (MS) medium containing 8.9 µM benzylaminopurine (BA). The isolated shoot meristems were cultured on MS medium

containing 0.89 µM BA. After 3-4 wks, multiple shoots were separated from the explant and cultured on half-strength MS medium for elongation and rooting. More than 90% of the regenerants formed roots. The rooted plantlets were transferred first to peat pellets and subsequently to the greenhouse. The plants were allowed to flower and set seed. At least six to seven plantlets were obtained from each meristem. We are using this protocol to establish the transformation protocol for genetic transformation of cowpea with herbicide-resistant gene. A Gene gun was used to bombard (shoot meristem with the binary vector) pTF102 containing bar gene that was coated with gold particles. After initial selection, several plants were selected for molecular analyses. However, none of them contained the herbicide-resistant gene. We are also using the Agrobacterium method for delivering the gene into cowpea.

The Extension Horticulture program recruited and provided technical assistance to 25 SSDF who diversified their farms by growing Southern Peas (Cow peas). Outreach activities for this effort were funded by USDA through the "Buy Local" program, and the USDA Strike Force Initiative. Wal-Mart purchased shelled peas from these SSDF during the growing season.

Aquaculture in Arkansas provides a local source of healthy, high protein, low fat food, and creates economic activity and jobs. To support family fish farmers, potential producers, and the general public, integrated research and extension programs were conducted. Activities consisted of research studies in the laboratory and on the experiment station, on-farm research trials, extension farm visits, calls, e-mails, newsletters, workshops, webinars, freshwater aquaculture eXtension content, and presentations. Water quality and fish health services were provided to support educational programs. Program planning was conducted through discussions with individual farmers and with farmer associations (e.g., Catfish Farmers of Arkansas, Arkansas Bait and Ornamental Fish Growers Association). Results of research studies and extension programs were also shared with peers across the country at national meetings and in journals and other publications.

This activity includes a variety of projects aimed at improving productivity and competitiveness of U.S. aquaculture. Projects reported on include: 1) pond production studies; 2) nutrition studies; 3) water quality studies; 4) disease work; 5) hatchery studies; and 6) economics and financial management analyses.

1) A variety of studies were conducted to improve management of pond production of catfish. These included evaluation of the commonly-used feed response method to estimate inventory, analyzing the effect of the biomass of carryover fish in multiple-batch catfish ponds, assessing the long-term effect of in-pond grading, and effects of winter feeding on growth, survival, and yield of catfish held over the winter.

2) Studies were conducted to determine basic nutrient requirements for alternative species such as largemouth bass, and test feed additives (such as prebiotics) in these species to determine their potiential inclusion in practical diets. Tank feeding trials, field trials, and method demonstrations were conducted.

3) Cool weather water quality and plankton dynamics in commercial catfish and baitfish farms were determined to enable improvements in production and management efficiencies. Statistical methods have been carried out to study the relationship between water quality parameters and phytoplankton composition. Statistical methods were used to study the correlation between water quality and plankton in commercial baitfish ponds during two stocking and production seasons. Statistical methods were also used to study the effects of water hardness and a dairy-yeast prebiotic on the distribution of GI microflora in fathead minnow.

4) Research was conducted to develop better methods for the detection, control, and eradication of aquatic animal diseases, to prevent losses of farmed bait and ornamental fish to infectious diseases and to prevent losses of cultured catfish to infectious diseases. Diagnostic laboratories assist in the diagnosis and management of aquatic animal diseases. Regulatory testing and biosecurity management was provided to facilitate the interstate and international movement of aquaculture products. The results are used as part of a farm biosecurity and loss prevention education effort.

5) Hatchery studies included work on: 1) passive grading of female catfish broodstock to select those ready for artificial spawning and 2) development of hatchery techniques to produce alligator gar for potential stocking programs. Models were constructed for growth of alligator gar for young and sub-adult.

The major gaps in the knowledge base addressed by this proposal include the importance of live feed to alligator gar larvae, lack of production characteristics for alligator gar raised to 300 mm TL in raceways and tanks, the importance of grading to minimize cannibalism, and the feasibility of using mechanical graders in alligator gar production. The overall goal of the hatchery alligator gar project is to develop biologically feasible and economically cost effective ways for the Arkansas Game and Fish Commission, and other state or federal hatcheries to produce 300 mm alligator gar.

6) A variety of economic analyses were developed to reduce costs of producing catfish and hybrid striped bass production. These included evaluation of the effects of prices of hybrid catfish and comparing the costs of producing hybrid striped bass fingerlings in ponds and indoor tanks. An intensive financial management program was initiated for catfish farmers that included intensive training programs on financial analysis and management of catfish farms. This was followed up by one-on-one assistance to catfish farmers to develop a long-term business plan for their farm business. Model for U.S. catfish and trout markets were constructed for assessing the impact of alternative policy options. Weekly store-level scanner data acquired from A.C. Nielson Inc. for 52 U.S. markets for the period of June 19, 2005 to June 12, 2012 were analyzed.

2. Brief description of the target audience

The primary audience for this program consists of Small and Socially Disadvantaged Farmers (SSDFs). Small Farms as defined by the National Commission on Small Farms are those farms with $250,000 in gross sales or less while Socially Disadvantaged Farmers are those who have been subjected to racial or ethnic prejudices because of their identity as a member of a group without regard to their individual qualities. Identified groups include: African Americans, Hispanics, Asians, American Indians or Alaska Natives, and Native Hawaiians or other Pacific Islanders. However, UAPB does not discriminate against any individual and services are provided to all who request it.

Aquaculture production primarily occurs on family farms; most are small business without resources to conduct internal research, and many find it increasingly difficult to keep informed of changing rules regulations without assistance from extension. Thus, primary target audiences include commercial baitfish and catfish producers, hatchery managers, and private pond owners throughout Arkansas, County Extension agents, grocery store managers, consumers, and state agencies involved in the regulation or control of aquatic animal diseases.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	91115	109263	2968	95

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

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	10	9	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- The number of research studies and demonstrations conducted

Year	Actual
2011	14

Output #2

Output Measure

- The number of farmers provided assistance in applying for USDA programs

Year	Actual
2011	255

Output #3

Output Measure

- The number of newsletters, fact sheets, etc. distributed

Year	Actual
2011	3086

Output #4

Output Measure

- The number of newspaper articles published

Year	Actual
2011	5

Output #5

Output Measure

- The number of field days held

Year	Actual
2011	1

Output #6

Output Measure

- Number of presentations made

Year	Actual
2011	115

Output #7

Output Measure

- The number of workshops and training sessions conducted

Year	Actual
2011	25

Output #8

Output Measure

- Number of refereed journal articles

Year	Actual
2011	16

Output #9

Output Measure

- Number of abstracts

Year	Actual
2011	50

Output #10

Output Measure

- Number of presentations

Year	Actual
2011	115

Output #11

Output Measure

- Number of trade magazine articles

Year	Actual
2011	1

Output #12

Output Measure

- Number of factsheets and newsletters

Year	Actual
2011	0

Output #13

Output Measure

- Number of peer reviewed journal articles

Year	Actual
2011	0

Output #14

Output Measure

- Number of publications

Year	Actual
2011	0

Output #15

Output Measure

- The number of farmers provided research-based best practices to increase animal productivity

Year	Actual
2011	77

Output #16

Output Measure

- The number of farmers provided technical assistance in crop production

Year	Actual
2011	390

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase the economic opportunity and quality of life for SSDF by improving their farm diversity and profitability.
2	An increase in the number of SSDF that adopt one or more Best Management Practices for crop and/or livestock production
3	Increase the number of farmers that develop an estate plan and/or a reduction in land loss by Socially Disadvantaged Farmers
4	Number of stores adopting recommendations
5	Number of Arkansans gaining access to catfish management information
6	Number of producers responding to research results
7	Number of producers willing to test successful ingredients of feeding strategies on a commercial scale
8	Number of fingerling producers that learned what we know
9	Number of scientists that learned what we know
10	Number of fingerling producers that use what we know
11	Number of Arkansans gaining access to hybrid catfish information
12	Number of Arkansans adopting hybrid catfish production
13	Number of producers who learn project results
14	Number of researchers that will cite results
15	Number of producers that will modify feeding and management
16	Percent decrease in cool weather mortalities and decrease in off-flavor
17	Percent cool weather plankton-related problems that will decrease

18	Percent warm weather plankton-related problems that will decrease
19	Percent of diets with new ingredients that are commercially available, or number of new feeding strategies implemented by industry
20	Potential increase of fathead minnow yields and profits
21	Test and technical assistance provided for shipping and water quality
22	Monitoring ponds for loss prevention
23	Scientists and soybean and catfish producers requesting nutrition and feeding strategies to improve production efficiency and product quality of catfish
24	Number of completed long-term business plans
25	Number of catfish farmers using improved management practices
26	Number of catfish and hybrid striped bass farmers with reduced costs of production
27	Financial impact of diagnostic services
28	Value of aquatic animal exports requiring inspection and biosecurity assistance
29	Awareness of cool weather water quality and plankton by catfish and baitfish farmers and scientists
30	Number of stakeholders using the results of seafood-market models
31	Number of stakeholders using the results of the analysis of national scanner data
32	Water quality correlations from cool and warm season sampling on commercial farms
33	Correlations in water quality plankton in commercial baitfish ponds during two stocking and production seasons
34	Comparison of non-linear growth models for alligator gar
35	Effects of water hardness and a dairy-yeast prebiotic on the performance, mineral composition and gut microflora of fathead minnow (Pimephales promelas) in tanks
36	pH management in golden shiner ponds
37	Water quality management in catfish split-pond system

38	Number of hatchery alligator gar produced in Arkansas
39	Number of fingerling producers that learned novel approaches to spawning catfish
40	Identifying the compounds that will de-stick goldfish and ballyhoo eggs from spawning substrate

Outcome #1

1. Outcome Measures

Increase the economic opportunity and quality of life for SSDF by improving their farm diversity and profitability.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	107

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many small and socially disadvantaged Farmers (SSDF) in Arkansas operate small tracts (1-50 acres) of lands. These small tracts are not suitable for the traditional crops like soybean, cotton or wheat which generally require many acres (1000 acres) to be profitable. However, if markets and labor can be identified for alternative crops like fruits or vegetables, these crops can be profitable for small farms.

What has been done
Extension Associates (EA) provided producers with counseling and fact sheets on the economics and production of selected vegetable crops. The university also worked with East Arkansas Enterprise Community (EAEC) who helped producers? market vegetables through a 13000 square foot demonstration and processing facility owned by the University.

Results
Approximately 200 acres of mix vegetables (squash, southern peas, greens, watermelon, butterbeans, cantaloupe, and okra) were grown by 30 SSDF. These SSDF marketed some of their vegetables through the processing facility and some directly to consumers (at local businesses). When compared to producing soybean or renting their land, these producers

increase their income by 250 percent above that expected from growing soybean or just renting their land. Twenty five SSDF increased their income by selling approximately 14,000 pounds of southern peas through Wal-Mart stores within the region. In addition, many SSDF used fresh vegetable to reduce their food expenses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #2

1. Outcome Measures

An increase in the number of SSDF that adopt one or more Best Management Practices for crop and/or livestock production

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Most small and socially disadvantaged farmers (SSDF) do not use extension recommendations on their farms. These producers obtain their information from other producers and supply dealers. In many cases crop and livestock yields from these producers are reported as below the county average. If yields on these farms could be improved, profitability could also be increased.

What has been done
Extension associates worked directly with producers to get them to start using four specific extension recommendations: soil testing, nematode testing, varieties selection, and chemical weed control recommendations. Some producers were provided with direct assistance in using the practices other were informed indirectly about using the practices to help increase yields.

Results
As a result of extension associate working directly with SSDF who generally resist changes or are late adopters: 30 took soil test, 30 used extension recommend varieties, 15 took nematode test,

50 used the Extension weed manual in applying herbicides for weed control, and 15 had plant diseases identified by sending samples to the disease clinic.

Approximately half of the producers who took soil test samples are planning to apply lime as indicated by the soil test result. The other half will use the soil test result to apply recommended fertilization. No producers had to plant nematode resistant varieties as indicated by the nematode test. All 10 producers increase their yields by an estimated 10 percent by using recommended varieties and 20 producers increase their yields by 20 percent as result of using Extension recommended herbicides for weed control.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants
302	Nutrient Utilization in Animals

Outcome #3

1. Outcome Measures

Increase the number of farmers that develop an estate plan and/or a reduction in land loss by Socially Disadvantaged Farmers

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Most small and socially disadvantaged farmers (SDDF), do not have estate plans. Consequently, when these producers die much of their land becomes heir property. The heir property is often difficult to operate because of absentee owners who don?t understand agriculture and making land improvements is often impossible. It can also be difficult to get the land to a interested family member when many heirs own the land. All of theses scenarios make heir property very risky to operate.

What has been done
Four estate planning workshops were conducted in different areas of the state. These workshops were designed to educate producers about the dangers of heir property and the consequences of not having an estate plan. The importance of having a succession plan for farm members wanting to pass the land to the next generation was also included.

Results
Approximately 200 individuals attended four workshops that were conducted. One participant brought her will to the meeting and decided to make several changes to her will after the meeting. Several other individuals changed their wills after the meeting. Thirty individuals said that they would start working on their estate plan after the meetings and 18 individuals developed estate plans.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
610	Domestic Policy Analysis

Outcome #4

1. Outcome Measures

Number of stores adopting recommendations

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics

Outcome #5

1. Outcome Measures

Number of Arkansans gaining access to catfish management information

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of producers responding to research results

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of producers willing to test successful ingredients of feeding strategies on a commercial scale

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of fingerling producers that learned what we know

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of scientists that learned what we know

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of fingerling producers that use what we know

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of Arkansans gaining access to hybrid catfish information

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Number of Arkansans adopting hybrid catfish production

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Number of producers who learn project results

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

Number of researchers that will cite results

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Number of producers that will modify feeding and management

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	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
302	Nutrient Utilization in Animals

Outcome #16

1. **Outcome Measures**

   Percent decrease in cool weather mortalities and decrease in off-flavor

   Not Reporting on this Outcome Measure

Outcome #17

1. **Outcome Measures**

   Percent cool weather plankton-related problems that will decrease

   Not Reporting on this Outcome Measure

Outcome #18

1. **Outcome Measures**

   Percent warm weather plankton-related problems that will decrease

   Not Reporting on this Outcome Measure

Outcome #19

1. **Outcome Measures**

   Percent of diets with new ingredients that are commercially available, or number of new feeding strategies implemented by industry

   Not Reporting on this Outcome Measure

Outcome #20

1. **Outcome Measures**

   Potential increase of fathead minnow yields and profits

2. **Associated Institution Types**

   - 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Production technologies for fathead minnow (Pimephales promelas) are decades behind those of the goldfish and golden shiner, and the vast majority of fish are still cultured using the spawning-rearing pond method. Research has shown that an intensive system of egg collection, indoor hatching and fry stocking is biologically feasible. Collection of fathead minnow eggs for indoor hatching has been identified as the single most costly step in this new method, and improving the efficiency of egg collection will improve the economic feasibility of indoor hatching. Research has demonstrated that production of fathead fry in hatcheries increases yields and profits. Commercial producers have not yet adopted this new technology.

What has been done
Three studies were conducted to support the development of a commercially feasible indoor hatching system for fathead minnows. Research was conducted to find potentially favorable locations for spawning substrates in brood ponds to maximize egg deposition, on the appropriate quantity of substrate, and on increasing the attractiveness of supplied substance through the use of egg mimics. Practical research has been conducted in experimental ponds. Extension of the technology to field conditions has been done on a minor scale.

Results
Adoption of an indoor hatchery system for fathead minnow would reduce the problem of contamination of fathead minnow stocks with mosquitofish, a prohibited species in some markets. Results of production trials using fathead minnow fry from a hatchery have demonstrated that high yields (2,500-4,500 lb/acre) of relatively uniform sizes of fish can be produced, increasing estimated profits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

Outcome #21

1. Outcome Measures

Test and technical assistance provided for shipping and water quality

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Post harvest losses of pond-raised live baitfish are a well-known problem. Live shipping success has been clearly linked to management of water quality. Live sales of bait species is essential to the industry.

What has been done
On-arm demonstrations have been conducted; projects with individual companies have been carried out.

Results
Live shipping success has improved through adoption of better management and more appropriate technology.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #22

1. Outcome Measures

Monitoring ponds for loss prevention

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Baitfish are cultured at very high densities; external parasites are a common cause of mortalities.

What has been done
Monitoring ponds and early intervention have become routine.

Results
Losses have been reduced whenever producers monitor ponds more closely and conduct early intervention.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #23

1. Outcome Measures

Scientists and soybean and catfish producers requesting nutrition and feeding strategies to improve production efficiency and product quality of catfish

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
High feed prices have reduced profit margins on catfish farms

What has been done
A pond trial was conducted to compare effects of a new ingredient, solvent-extracted distillers' dried grains with solubles (SE-DDGS) to traditional catfish diets at two protein levels.

Results
Highest yields were obtained from the 28% protein SE-DDGS diet and lowest from the 32% protein traditional diet. Yields for fish fed the 32% protein-DDGS and 28% traditional diet were similar and intermediate to the two other diets. FCR of 32% protein-traditional diet (2.02) was significantly higher than for the other diets (1.72). Total feed consumption for the 28% protein-DDGS diet (6.5 tons/ac) was significantly higher than for the other diets (5.9 tons/ac). Two-way ANOVA showed significant effects of both protein amount (28% > 32%) and protein source (DDGS>traditional diet) on gross yield, carryover survival, FCR, and total feed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #24

1. Outcome Measures

Number of completed long-term business plans

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	119

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Catfish feed costs soared beginning in 2008, reaching the highest levels ever and have remained at higher-than-average levels. Given that feed is the single largest cost component of catfish production, the increased costs of feed have dramatically increased costs of production. It has been difficult to pass these cost increases through to end consumers, given market structures and conditions, and farm-level profits have decreased.

What has been done
An intensive financial management program was initiated for catfish farmers that included

intensive programs on financial analysis and management of catfish farms. This was followed up by one-on-one assistance to catfish farmers to develop a long-term business plan for their farm business.

Results
More than 119 long-term business plans were developed by catfish farmers who participated in the program. Participants learned how to prepare and analyze financial analyses and indicators to set specific goals for the coming year and how to project out likely outcomes from the changes to be implemented. Many participants identified ways to either pay down their debt more quickly or how to increase their revenues.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #25

1. Outcome Measures

Number of catfish farmers using improved management practices

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Increasing feed costs have reduced profit margins and increased the need to improve production and financial management on farms, reducing overall costs of production. The presence of carryover (fish > 350 g stocked the previous year but not yet market size) channel catfish, (Ictalurus punctatus), in multiple-batch production ponds has been shown to affect overall production performance and costs. However, little attention has been paid to effects of varying biomasses of carryover fish in ponds. Periodic grading and harvesting of fish has been shown to increase production of some species by removing larger fish throughout the growing season, reducing overall biomass, and increasing growth of smaller fish. Previous work suggested that feeding catfish, (Ictalurus punctatus), more frequently over the winter may reduce losses. Restaurant patrons, particularly in upscale locations, increasingly prefer entrees developed from portions cut from fillets larger than those currently sold by the U.S. catfish, (Ictalurus punctatus),

industry.

What has been done

Four different pond studies were conducted during both the main production season and over the winter. These studies provided data and information from which to refine management recommendations for catfish farmers. Study 1: twelve 0.1-ha earthen ponds were stocked 20 March 2007 with 15,000 catfish fingerlings per ha (mean weight of 31 g), and carryover fish at either 726 kg/ha, 1,460 kg/ha, or 2,187 kg/ha (mean weight of 408 g, range of 204 g to 703 g) to compare the effect of three different biomasses of carryover catfish on the production performance of understocked fingerlings. Study 2: Two two-year studies measured production and economic effects of the UAPB grader as compared to traditional live car grading and assessed effects of frequent harvesting and grading. Multi-batch production systems were used in both studies. Study 3: Twelve 0.10-ha ponds were stocked with 987 kg/ha market-sized fish and 2,960 kg/ha sub-marketable fish November 2008 with treatments of: (1) unfed; (2) fed daily (90d); and (3) temperature-threshold feeding (62d). Study 4: A production study evaluated the feasibility of producing the necessary size (1.6 kg) of catfish. Twelve 0.1-ha earthen ponds were stocked with 0.363-kg channel catfish at 2,500 (low); 5,000 (medium); or 7,500 (high) fish/ha, with four replicates.

Results

Study 1: Gross and net yields increased with increasing biomass of carryover fish. Growth and mean weight at harvest of fingerlings were significantly greater at the lower biomass of carryover fish (<1,460 kg/ha), but there was no difference between the medium and high carryover density treatments. Net returns were highest with the highest biomass of carryover fish, but fell by $688/ha in Year 2 due to slower growth of fingerlings in Year 1. Study 2: Fingerlings grew significantly better in ponds graded with the UAPB grader (0.97 g d-1) as compared to the traditional live car (0.80 g d-1) and resulted in significantly fewer over-sized fish (>1.51 kg), more frequent receipt of revenue, and improved cash flow. Economic analysis showed that: 1) it was economically advantageous for catfish farmers to switch to the UAPB grader under a variety of farm size and processor dockage scenarios; 2) increasing the frequency of harvest up to four harvests/year resulted in fewer over-sized fish, less dockage at the processing plant, improved cash flow, and more favorable economic outcomes. Study 3: Total gross yield was significantly greater for the temperature-threshold feeding treatment than the unfed control, but survival and mean weight of fish at harvest were not. Net yield was negative for all treatments, due primarily to mortality of market-sized fish. Plasma glucose and insulin-like growth factor-1 did not differ significantly but plasma osmolality was significantly lower in fasted than in fed fish. Mean feed consumption rates in vats provided evidence to support more frequent feeding over the winter. Overwintering costs were $0.11/kg with temperature-threshold feeding. Study 4: Mean individual weight at harvest exceeded the mean target weight (1.6 kg) at the two lower densities, and the minimum target weight (1.36 kg) at the highest density. Percentages of the fish (by weight) that did not meet the minimum weight required were: 1%, 5%, and 18%, in the low, medium, and high density treatments, respectively. Yields were significantly greater at higher densities ($P<0.05$). Costs of production at the two higher densities were 4 to 7% higher than in the traditional multiple-batch system, but increased to 51% at the lower density. Results demonstrated that biological feasibility depends on: 1) the price premium paid; and 2) development of a market for fish sizes between current acceptable maximum sizes accepted and 1.36 kg.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #26

1. Outcome Measures

Number of catfish and hybrid striped bass farmers with reduced costs of production

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Study 1: Previous studies have indicated that the price premium charged for hybrid catfish fingerlings may be a significant factor in the adoption and profitability of hybrid catfish production. Study 2: Year-round production of hybrid striped bass (♀ Morone chrysops x ♂ M.saxatilis)fingerlings would allow foodfish growers to sell product throughout the year, improving consistency of market supply and cash flow for the farm. However, pond production of fingerlings is seasonal and precludes year-round supply. Tank culture methods have been developed to produce hybrid striped bass fingerlings indoors throughout the year, but the associated costs have not been estimated nor compared with pond production costs.

What has been done
Study 1: An enterprise budgeting simulation analysis was developed to compare costs, risk, and effect of hybrid fingerling costs. Study 2: Economic engineering techniques were used to estimate production costs of phase I hybrid stripted bass fingerlings in ponds (0.4-ha, 1.2-ha,or 2.4-ha) and tanks (945-L; 2,457-L; or 5,670-L) for production scales of either 50,000; 100,000; 250,000; 500,000; 1,000,000 or 2,000,000 fingerlings per year.

Results
Study 1: Feed, fingerling, and total costs ($/ha and $/kg) were highest for hybrid catfish production, intermediate for NWAC-103,and lowest for normal channel catfish production. Net returns were highest for hybrid catfish production, but breakeven priceswere also highest. Risk analysis showed that downside risk (risk of losing money) was higher for hybrid production for all farm sizes.Risk-averse farmers would not select hybrid catfish at the mean fingerling values used in the analysis. However, at hybrid fingerlingprices less than $0.0081/cm, hybrid catfish production was superior in profitability and breakeven cost of production. Thus, for hybrid catfish production to be preferred economically to normal channel catfish, the price premium for hybrid catfish fingerlings can be no more than 84% (0.0037/cm) above that of normal channel catfish

fingerlings and 57% (0.0025/cm) above that of NWAC-103 fingerling prices. Study 2: Results demonstrated economies of scale in terms of the volume of production and of size of production unit. Overall, pond production per 1,000 fingerlings was substantially less expensive than tank production, even when accounting for an increased number of annual production cycles in tanks as compared to ponds. Production costs were sensitive to survival rates and can be reduced by 7-14% and 5-11% for each 5% improvement in survival in ponds and tanks, respectively. Substituting microcyst brine shrimp for rotifers may have potential to reduce tank costs of producing hybrid striped bass depending upon fingerling survival beyond 14 days post hatch. Additional research is needed to improve overall fingerling survival both during the early fry rearing stage and after training to dry feed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

Outcome #27

1. Outcome Measures

Financial impact of diagnostic services

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Losses to infectious and environmental diseases have a major impact onc commercial aquaculture and are important in private ponds and in natural fisheries. Rapid and accurate diagnosis of disease problems is critical to the prevention of losses and to the control of aquatic pathogens.

What has been done
UAPB operates four regional Fish Disease Diagnostic Laboratories that provide water quality analysis, pathogen testing, and disease prevention and management advice. These services are supported by a research program that emphasizes the development of diagnostic assays, the detection of emerging diseases, and methods to control or eradicate disease organisms.

Results
The diagnostic labs handled approximately 800 sick fish cases in 2011. If it is assumed that $1,500 to $3,000 is saved each time a sample is submitted to the labs, it means that 1 to 2.5 million dollars in economic losses were prevented. This may be rather conservative since the typical aquaculture pond contains from 20 to 50 thousand dollars worth of fish. This calculation also fails to account for fish losses prevented by water analysis and potential benefits from successful biosecurity efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #28

1. Outcome Measures

Value of aquatic animal exports requiring inspection and biosecurity assistance

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Interstate and international movements of live aquatic animals are subject to strict health inspection and biosecurity requirements. Inspections must be conducted in certified laboratories using recognized protocols and must be conducted with great efficiency to reduce the financial and legal burdens faced by aquatic animal producers that move product across state lines.

What has been done
UAPB operates four regional Fish Disease Diagnostic Laboratories that provide fish health inspection guidance, testing services, and biosecurity management for Arkansas producers, for out of state facilities important in the marketing and distribution of Arkansas products, and for state agencies that manage wild fish populations. The UAPB laboratory is approved by APHIS to conduct export inspections. Extension personnel work closely with regulators to ensure safe and legal movements of Arkansas products.

Results
The total value of bait, ornamental, and sportfish exported live from Arkansas is approximately $30,000,000/yr. With the current regulatory climate, the vast majority of these movements are legal only because of inspections done by the UAPB Fish Disease Diagnostic Laboratories. Thus, the impact of the fish health inspections done by UAPB exceeds $20,000,000/yr.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #29

1. Outcome Measures

Awareness of cool weather water quality and plankton by catfish and baitfish farmers and scientists

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Cool weather water quality and plankton dynamics are not as well known as those of the warm weather production season. However, fish must be overwintered and losses may occur from poor water quality and off flavor algae may prevent harvests.

What has been done
Sampling of four farms and 3 ponds per farm was performed weekly during the cool season and monthly during the warm season for two consecutive years in commercial catfish and commercial baitfish operations.

Results
Cool weather off flavor algae were detected and documented in catfish pond sampling. Baitfish pond sampling revealed a correlation between water quality parameters, including pH and TDS (total dissolved solids). This information may be of use in control of problem pH.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #30

1. Outcome Measures

Number of stakeholders using the results of seafood-market models

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Catfish and trout aquaculture have grown into industries of significant importance in several regions of the United States (U.S.). Dynamics of the national economy, federal and state policies, and international trade can have significant and unanticipated effects on the competitiveness of the U.S. catfish and trout markets. Quantitative models are often used to forecast industry trends, effects of anticipated macroeconomic factors, and impacts of proposed policy initiatives.

What has been done
The University of Arkansas at Pine Bluff has recently constructed models for the U.S. catfish and trout markets for assessing the impact of various policy options. Both of the models (US-Catfish Model and US-Trout Model) consist of three cores namely a consumer core, producer core and trade core. The models integrate common features of partial equilibrium and gravity models to assess effects on prices and quantities demanded and supplied under a variety of alternative policy options. The US-Catfish Model differentiates among U.S. farm-raised catfish, imported catfish and imported basa/tra, and assesses the impact of changes in 'feed price', 'generic advertisements', 'import tariff', 'country of origin labeling', 'exchange rates', and 'national income' on demand for and supply of these products in the U.S. market. The US-Trout Model considers imported trout and U.S. domestic trout as distinct products, and simulates the effects of changes in import tariffs and exchange rates on demand for and supply of domestic trout and imported trout in U.S. market.

Results
These models and the results of the model-based analysis are being used by various stakeholder groups. The US Senate Committee on Agriculture, Nutrition and Forestry has used some of the

results from our catfish model in designing farmer friendly aquaculture policies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #31

1. Outcome Measures

Number of stakeholders using the results of the analysis of national scanner data

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Seafood retailing in the United States (U.S.) is carried out via two chief outlets: restaurants and grocery stores. There has been no major study attempting to understand the seafood grocery sector at national level in the U.S. The grocery sector needs to be analyzed in greater depth in order for seafood business to succeed in these times of rapid market change. Increased understanding of trends in supermarket sales of seafood and fish has potential to assist the U.S. aquaculture industry to refine marketing strategies and targets. The Aquaculture/Fisheries Center of the University of Arkansas at Pine Bluff has obtained funding support from the Southern Regional Aquaculture Center (SRAC) for the research project "Using National Retail Databases to Determine Market Trends for Southern Aquaculture Products" to analyze the recent status and trends of markets for the four southern U.S. aquaculture products, namely catfish, clam, crawfish and shrimp. The project team has been analyzing the national scanner data that contain details of the quantity, price, and hence expenditure, on products sold in a grocery market.

What has been done
he Aquaculture/Fisheries Center of the University of Arkansas at Pine Bluff has acquired store level scanner data for 12,898 seafood products. The data includes information on 84 seafood species (or species groups) of unbreaded frozen products, 30 species of breaded frozen products, 40 species of entrées, and 5 species of canned products. The data covers 209

marketing chains over 52 U.S. cities and all U.S. Censuses divisions. The data period is from four weeks (cumulative) ending on 7/16/2005 to four weeks (cumulative)ending on 6/16/2007 and from week ending on 6/23/2007 to week ending on 6/12/2010 (total 156 weeks). The project has carried out descriptive as well as econometric analysis.

Results
The data show that supermarket sales of frozen and chilled fish and seafood have grown over the past 5 years. Unbreaded shrimp is the most dominant product amongst all the finfish and shellfish frozen products. Catfish sales have increased as have sales of tilapia, salmon, and basa/tra, while sales of pollock have decreased. Tilapia sales have demonstrated the greatest rates of increase. Market trend analysis of scanner data shows that tilapia marketers diversified their products into entrée products over the years. Tilapia and basa/tra sales have increased rapidly in the last several years, particularly in the western region. Crawfish in the unbreaded form consistently saw drops in share, while shares in entrée crawfish increased. Clams had decreased sales over the last five years, but the reduction in sales was slowing down.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

Outcome #32

1. Outcome Measures

Water quality correlations from cool and warm season sampling on commercial farms

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Water quality during the warm catfish growing season has attracted a great deal of attention, and less so during the cool season when water quality is judged to be better due to reduced feeding and lower temperatures. However, winter mortalities suggest water quality issues exist.

What has been done

Critical water parameters were measured weekly from 0900-1100 during the cool (Nov-April) season and warm season (May-Oct) in 12 catfish commercial ponds at 4 farms located in southeast Arkansas over two years. Morning sampling was also conducted monthly during the warm seasons.

Results
Correlations with r values greater than 0.4 (>40% correlated) from the pooled data showed that TAN had a significant positive relationship with UIA, and Temp a significant negative relationship with DO in cool season. TDS was also significantly correlated with TAN, but at the +0.3 level. In the warm season, TAN and pH had positive significant relationships with UIA. Differences are attributed to the reduced influence of algae and feed inputs during the winter and increased influence of physical factors.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #33

1. Outcome Measures

Correlations in water quality plankton in commercial baitfish ponds during two stocking and production seasons

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Not much has been done on baitfish research of the water quality and plankton in both the stocking and production season.

What has been done
The Principal Component Analysis and Multiple Regression Analysis Models were used to study the relationship between water quality and plankton.

Results

Use information was provided to baitfish farmers pertaining to water quality and plankton.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #34

1. Outcome Measures

Comparison of non-linear growth models for alligator gar

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Alligator gar Atractosteus spatula has become a species of interest during the last decade. Little is known about the growth rate for this species.

What has been done
Data was collected. The non-linear statistical model was used to determine the growth of the young and sub-adult alligator gar.

Results
Natural Resource Managers were provided analysis for a better understanding of growth of the alligator gar species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
602	Business Management, Finance, and Taxation

Outcome #35

1. Outcome Measures

Effects of water hardness and a dairy-yeast prebiotic on the performance, mineral composition and gut microflora of fathead minnow (Pimephales promelas) in tanks

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Fathead minnow (FHM, Pimephales promelas) is widely used as a toxicological and biomedical model in research. The nutrient requirements and composition of the gastrointestinal (GI) microflora of fathead minnow are virtually unknown.

What has been done
Statistical methods such as multinomial logistic regression were used to study the effects of water hardness and a dairy-yeast prebiotic on the distribution of GI microflora in fathead minnow.

Results
Information provided for live and prepared diets used to maintain this species for research and commercial purposes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
602	Business Management, Finance, and Taxation

Outcome #36

1. Outcome Measures

pH management in golden shiner ponds

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Golden shiner Notemigonus crysoleucas is one of the most important baitfish cultured in Arkansas.

What has been done
pH, dissolved oxygen (DO), conductivity, water temperature, alkalinity, hardness, and ammonia were monitored in two types of golden shiner ponds (newly filled and old), three water layers (5 cm, 20 cm, and 50 cm; Alkalinity, hardness, and ammonia were only monitored at the 50 cm layer), and two time points (morning 8:00-9:00 am and afternoon 1:00-2:00 pm) from June to October 2010.

Results
pH (mean ± S.D.) was significantly higher in the old ponds than those in the new ponds ($P < 0.001$; e.g., pH = 8.88 ± 0.50 for new ponds at 5 cm layer in the morning and pH = 9.24 ± 0.52 for old ponds at 5 cm layer in the morning), and significantly higher in the afternoon than those in the morning (P , 0.0001; e.g., pH = 8.88 ± 0.50 for new ponds at 5 cm layer in the morning and pH = 9.28 ± 0.46 for new ponds at 5 cm layer in the afternoon, and pH = 9.24 ± 0.52 for old ponds at 5 cm layer in the morning and pH = 9.57 ± 0.51 for new ponds at 5 cm layer in the afternoon. There was no significant difference of DO between the pond types ($P > 0.1$). DO concentrations decreased significantly from the surface to the lower water layers (P , 0.0001), and increasing significantly from the morning to oversaturation in the afternoon (P , 0.0001).

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #37

1. Outcome Measures

Water quality management in catfish split-pond system

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Catfish farmers have begun to construct and manage several variants of the split-pond system developed at Mississippi State University.

What has been done
Three types of commerical catfish ponds were studied: a) Traditional Earthen Pond System (TEPS; n = 3 ponds, area = 3.56 ± 0.20 ha/pond, stocking density = 17,422 ± 1,979 head/total pond ha/ b) Single-Cell Split Pond System (SCSPS; n = 2 ponds, area = 3.89 ± 0.63 ha/pond, waste to fish area ratio of 2.75 : 1, stocking density = 25,714 ± 1,445 head/total pond ha), and c) Multiple-Cell Split Pond System (MCSPS; n = 3 ponds, area = 3.64 ± 0.0 ha, waste to fish area ratio of 1 : 1, stocking density = 40,287 ± 180 head/total pond ha).In the TEPS, the efficient aerated zones (i.e., zones with DO ≥ 2 mg/L) varied from 0 to 61 m away from the aerators. One of the three monitored ponds had all measured DO levels below 2 mg/L. Ammonia increased from the aerator side (minimum = 0.52 mg N/L) to the other side of the pond (maximum = 1.3 mg N/L), with pH values ranging from 7.56 to 8.02 in these ponds.

Results
The current results indicated that the split-pond systems maintained early morning DO concentrations above 2 mg/L and were relatively homogeneous in the fish zones even with high fish stocking densities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #38

1. Outcome Measures

Number of hatchery alligator gar produced in Arkansas

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Throughout its North American range, alligator gar have experienced declines in population abundance. These declines were likely due to commercial and recreational fishing pressure, and to harvest by anglers who believe that gar consume sport fish. Habitat alterations are also responsible for declines in alligator gar abundances. For example, dredging dams, dikes, and levees have altered most lotic systems within the Mississippi River drainage. In regulated rivers, access to side-channels and flooded backwaters is often limited. Alligator gar require shallow water, such as flooded terrestrial habitat for spawning. If spawning habitat continues to decline, the populations of alligator gar are likely to do so as well.

What has been done
Alligator gar were raised to 275 mm in 75-L acrylic aquaria on a combination of formulated feed and forage fish.

Results
Alligator gar larvae from the Tupelo USFWS hatchery were produced early this year. Their viability was negligible. We attempted three different studies, but all three were terminated due to heavy mortality. Larvae did not appear to develop or feed correctly. This was true at all locations where Tubelo hatchery alligator gar were shipped.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #39

1. Outcome Measures

Number of fingerling producers that learned novel approaches to spawning catfish

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Catfish producers in the state of Arkansas are interested in producing hybrid catfish. This practice requires a novel approach to spawning catfish and the integration of experimental data into practical approaches for the farmer.

What has been done
On going collaborations with a private hatchery in 2011 tested three forms of spawning aides: Catfish pituitary, Carp pituitary, and LHRHa to induce artificial spawning to produce hybrid catfish. Examinations of a system of passive grading of female catfish broodstock to select those ready for artificial spawning were continued. UAPB researchers act as a conduit for reporting of data describing the use of spawning aids to the INAD permit holder, the USFWS.

Results
Field trials of induction of artificial spawning techniques continue at the private hatchery. The primary tests consist of evaluation of different compounds to induce artificial spawning. A general improvement in ovulation rates for LHRHa fish has been observed over the years of testing at the hatchery, however the time between the resolving dose and ovulation is more variable than piuitary extracts. This latter feature imposes some difficulties planning for personnel but comments from the farmer/hatchery manager provide some anecdotal evidence that there may be a difference in egg quality between pituitary extracts and LHRHa. Evaluations at the hatchery have been performed since 2006. During 2006, the average ovulation rate over the spawning season was increased significantly. This general improvement in spawning success across this five year period has led to the hatchery becoming a primary producer of hybrid catfish fingerlings in the United States.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #40

1. Outcome Measures

Identifying the compounds that will de-stick goldfish and ballyhoo eggs from spawning substrate

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The inability of producers to remove goldfish eggs from spawning substrate does not allow for the producer to accurately count the number of fry that are stocked into a pond. Mats are currently placed into ponds where eggs hatch. The number of eggs per mat is usually a guess and the number of fry hatched and produced in the pond is often an inaccurate estimate of the true population. De-sticking eggs from spawning material is also a bottleneck for the commercial efficiency for Ballyhoo (Hemiramphus sp). Another bottleneck with ballyhoo is the hatching rates of the eggs have been low. Removal of ballyhoo eggs from the spawning substrate would enable producers to efficiently collect and hatch eggs. By hatching eggs in a controlled environment, hatching rates in goldfish and ballyhoo may also be increased.

What has been done

Spawning mats containing freshly laid (<12 h) goldfish eggs were obtained from a local fish farm. Mats were cut into 3 x 3 inch squares and placed into 1 pint beakers containing one of the folllowing concentrations of a selected solution: sodium sulfite, 1.5%, 2.0% and 3.0%; tannic acid 75% and urea 3%, 4%, 6%, and 8%; control in hatchery water; fresh squeezed pineapple juice 1%, 3%, 5% and 10%; bromelain 1%, 3%, 5% and 10%; papaya 1%, 3%, 5% and 10%; cadavarine 1 mg/L, 3 mg/L, and 5 mg/L; lysozyme; acetone; sodium bicarbonate; sodium hydroxide; ammonium chloride; ethylene glycol mono-butyl ether; propolyene glycol n-butyl ether; citric acid; and alcalase, 20 mL/L, 40 mL/L and 80 mL/L. Eggs were placed into treatment solutions for 2 minutes and removed. Loose eggs and eggs still attached to the substrate were counted and the percentage of eggs removed was calculated. The eggs were then placed into a tank and allowed to hatch. Newly hatched fry were counted and the percent survival was calculated.

Results

Significant removal of eggs was only accomplished with the alcalase enzyme. The 20 mL/L alcalase treatment removed 10% of the eggs from the mat, the 40 mL/L treatment removed 78% and the 80 mL/L treatment removed 82% of the eggs in 2 minutes. To increase the number of eggs removed the alcalase was mixed in a 3% salt solution. Removal of eggs exposed to 20 mL/L alcalase with 3% salt was 36%, for 40 mL/L was 99% and for the 80 mL/L was 100%. Survival of egs to hatch was low with less than 2% surviving. This may have been due to the fact that the eggs were not placed into hatching jars but laid in a single layer on the bottom of an aquarium. Eggs did succumb to fungal infections. Once the egg membrane compounds are identified, other potential compounds will be tested and eggs will be hatched in a hatching jar.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

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

Brief Explanation

The USDA "Strike Force Initiative" was one public policy change of note. The initiative allowed Small and Disadvantaged Farmers (SSDF) in the state to market southern peas through Wal-Mart stores in the region. Weather tended to cause problems for all farmers in the state. The spring of 2011 was cold and wet in many part of Arkansas. Flooding was common in the eastern part of the state and crop production was delayed. Also, some livestock producers lost livestock. The cold and wet conditions were followed by hot and dry conditions especially in southwestern Arkansas. Vegetable farmers and row crop farmers who did not have irrigation were at the mercy of nature while livestock producers in southwestern Arkansas had to start to feed hay early and in some cases they had to reduce their herd size. Hay became expensive and hard to get.

Higher prices of catfish in 2011 resulted in a profitable year for catfish farmers. Farm profits have allowed farmers to begin to feed more and have more capital to make productivity - enhancing changes on their farms.

The economy has had a negative impact on aquaculture producers, particularly through a dramatic increase in the price of fish feed ingredients. Research on fish feed that utilize alternative, lower cost ingredients is being conducted to address this need.

Appropriation changes have resulted in fewer funds to conduct research and extension programs to address rapidly changing circumstances, such as a new fish bacterial disease and tapeworm eradication.

We must have farm collaborators to conduct our studies. Some experiments are contingent on natural outbreaks of disease.

This proposal was funded near the end of the spawning season for goldfish. As a result, insufficient numbers of eggs were collected for membrane compound determination. Until the membrane comopounds are determined, chemical dissociation of adhesive compounds is literally a shot in the dark.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The financial planning program resulted in a number of positive outcomes as farmers identified ways to either reduce their debt, increase revenue, or improve productivity.

Information for baitfish commercial catfish farmers was provided from the statistical models used.

Provide basis for ones conducting research on alligator gar species. Length and age relationship - provide feedback to managers.

pH management in golden shiner ponds resulted in a number of positive outcomes as farmers started to realize the pH issue in their ponds.

Farmers started to adopt different versions of new catfish culture systems.

Data are gathered on efficacy of artificial spawning procedures. Scientists at UAPB are responsible for monitoring field trials evaluating spawning aides that stimulate ovulation.

Commercial bait and ornamental fish farmers were surveyed at the annual meeting regarding program impacts. Responding farmers reported communicating with university personnel regularly, typically weekly (ranged from 15 to over 100 times per year). Individual farmers reported annual savings due to university research and extension efforts to be in the range of $2,000 to over $100,000 (four farms).

Written surveys are conducted during industry association meetings. Electronic audience response devices are used to collect audience data during many of the biosecurity presentations. Audience members report significant increases in their understanding of biosecurity and in their ability to deal with biosecurity issues.

Progress on the determination of membrane compounds is dependent on the researchers at LSU. They have been successful in separating those compounds and currently are attempting to identify them. The mass desticking attempt has shown the alcalase used with a mild salt solution does remove some eggs, but viability is questionable.

Key Items of Evaluation

The long-term business plans provide a detailed basis for demonstrating improvement in financial performance from one year to the next.

In pH management of golden shiner ponds one mechanism of fish disappearance was clarified.

Key water quality issues were clarified for fish production.

A hybrid catfish fingerling producer located in Arkansas has been able to continuously improve in ovulation success and fingerling production over the course of this project.

Cost savings are important. In additon, a key item in evaluating program success is the opinions of fish farmers regarding the program. In a survey, farmers were asked to comment on any aspects of the UAPB Extension Program. Responses included: "I am proud we have UAPB Extension program, this has been a great help to our operation", "Excellent research and dedication", "Very good"; and "Great program".

Farmers have initiated programs to prevent disease outbreak. Farmers have also

initiated biosecurity measures to prevent disease spread.

Key evaluation factor is the removal of eggs from spawning substrate and high survival rates of fry.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components		0%		80%
703	Nutrition Education and Behavior		0%		20%
	Total		0%		100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	1.7
Actual Paid Professional	0.0	0.0	0.0	0.2
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	187637
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	0	83044
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

The lactose survey was completed among 73 participants, students at the University of Arkansas at Pine Bluff to find out:

1/ the number of participants who where clinically diagnosed with lactose intolerance
2/ the percentage of participants experiencing symptoms of lactose intolerance
3/ Dairy avoidance among participants
4/ the frequency of lactose intolerance symptoms among participants

2. Brief description of the target audience

The target audience was made of 73 African American students enrolled at the University of Arkansas at Pine Bluff (UAPB). The majority were 19 to 25 years old and they were 12 male, 52 females, and 9 participants did not specify their gender.

3. How was eXtension used?

Results of the survey were presented at the 2012 Research forum on March 7, 2012 at the campus of UAPB.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	73	50	0	0

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

Patent Applications Submitted

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of research publications

Year	Actual
2011	0

Output #2

Output Measure

- # of promising crop lines identified
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- # of successful food recipes
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- 1. number of yogurts to be microbiologically tested
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- 2. number of participants to be recruited for the feeding study
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- 3. number of participants in the feeding study
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- 4. number of participants in workshop on yogurt containing probiotics
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- 5. number of panelists for the acceptability study
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- 6. number of participants in workshop on increased consumption of dairy products
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	1. Increased consumption of yogurt containing effective probiotics by at least one serving among participants
2	2.Reduced symptoms of lactose intolerance among participants
3	3.Increased calcium intake among participants
4	4.Reduced weight gain among participants
5	5.Increased awareness of health benefits of yogurts and dairy products containing probiotics to the public
6	6.Increased consumption of at least one serving of a nutrient-dense dairy product by the public
7	# of people accept/like the new crop varieties
8	# of people have knowledge about the new crop varieties
9	# of people use and benefit from the new crop varieties and new food sources & recipes
10	7. increased vitamin D intake among participants

Outcome #1

1. **Outcome Measures**

1. Increased consumption of yogurt containing effective probiotics by at least one serving among participants

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

2.Reduced symptoms of lactose intolerance among participants

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

3.Increased calcium intake among participants

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

4.Reduced weight gain among participants

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

5.Increased awareness of health benefits of yogurts and dairy products containing probiotics to the public

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

6.Increased consumption of at least one serving of a nutrient-dense dairy product by the public

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

# of people accept/like the new crop varieties

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

Outcome #8

1. Outcome Measures

# of people have knowledge about the new crop varieties

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

Outcome #9

1. Outcome Measures

# of people use and benefit from the new crop varieties and new food sources & recipes

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #10

1. Outcome Measures

7. increased vitamin D intake among participants

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Other (recruitment of students for the nutrition education study)

Brief Explanation

This spring 2012, students clinically diagnosed with lactose intolerance have been recruited to participate in the nutrition education study to increase their dairy products consumption. So far, number of students recruited is very low.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Fourteen (14) participants out of 73 (19%) have been clinically diagnosed with lactose intolerance.

Twenty-five (25) participants (34%) indicated experiencing symptoms of lactose intolerance.

Nine (9) participants (6.7%) thought that symptoms of lactose intolerance affect their everyday life.

Dairy avoidance in 19 participants (26%) may result in deficiencies of calcium, vitamin D, potassium, and magnesium. Frequencies for symptoms of lactose intolerance are the following: gas 31%, bloating 23%, borborygmi 16%, diarrhea 11%, nausea 9%, pain cramps 9%. Most participants who avoided dairy products showed interest in consuming dairy products if they could tolerate them

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety in Aquaculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components		100%		0%
	Total		100%		0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	0.0
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	49114	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	39456	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The 2008 Farm Bill included provisions to move inspection of catfish from FDA to USDA-FSIS. However. this provision has yet to be enforced. It has been hampered by a lack of understanding of production and processing practices of catfish in the U.S. and of basa/tra in Vietnam.

2. Brief description of the target audience

The target audience are members of the USDA-FSIS and the general public, including catfish farmers and processors.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	110	1500	0	0

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Briefings to catfish farmers and catfish processors

Year	Actual
2011	3

Output #2

Output Measure

- Number of presentations to catfish farmers and processors

Year	Actual
2011	2

Output #3

Output Measure

- Number of emails, phone calls, and conference calls to catfish farmers and processors

Year	Actual
2011	4

Output #4

Output Measure

- Number of newsletters, fact sheets, etc

Year	Actual
2011	1

Output #5

Output Measure

- Number of field days held

Year	Actual
2011	1

Output #6

Output Measure

- Number of presentations made

Year	Actual
2011	3

Output #7

Output Measure

- Number of workshops and training sessions conducted

Year	Actual
2011	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	We will provide technical assistance to USDA-FSIS by continuing to serve on panels and focus groups with FSIS
2	Number of contacts with catfish farmers and processors related to the new catfish inspection program

Outcome #1

1. Outcome Measures

We will provide technical assistance to USDA-FSIS by continuing to serve on panels and focus groups with FSIS

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
USDA-FSIS is required to do a vulnerability assessment using the Carver Shock Method on international imports of catfish and catfish-like products, but had little direct experience with international production and processing methods

What has been done
The Vulnerability Assessment was completed using the Carver Shock Method by USDA-FSIS

Results
Number of contacts with catfish farmers and processors related to the new catfish inspection program

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

Outcome #2

1. Outcome Measures

Number of contacts with catfish farmers and processors related to the new catfish inspection program

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Regulatory personnel were not familiar with catfish production practices for catfish in the U.S. and basa/tra in Vietnam. Lack of familiarity with these practices could result in inappropriate inspection rules and guidelines that may not result in the desired improvements in food safety, particularly of imported product.

What has been done
A series of consultations have been provided to USDA-FSIS and related agencies through teleconferences, in-person consultations, submission of the relevant scientific knowledge base, and service on panels related to the rule-making process.

Results
While the Catfish Inspection Rule has been held up in the inter-agency review process, it is clear that USDA-FSIS personnel have become more familiar with the scientfic knowledge base of catfish production in the U.S. and of basa/tra production in Vietnam.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

V(H). Planned Program (External Factors)

External factors which affected outcomes
- Public Policy changes
- Competing Public priorities

Brief Explanation

The Catfish Inspection Rule included in the 2008 Farm Bill has yet to be enacted. Seafood importing and trade advocates have delayed its release.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Since the rule has not yet been enacted yet, it is not possible to evaluate it.

Key Items of Evaluation

Key items of the evaluation will include the incidence of contaminants in imported catfish-like products.