

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security - Animals and Their Systems, Production and Health

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	15%	20%	20%	30%
302	Nutrient Utilization in Animals	15%	20%	20%	20%
303	Genetic Improvement of Animals	15%	17%	17%	20%
307	Animal Management Systems	15%	18%	18%	0%
311	Animal Diseases	5%	10%	10%	20%
312	External Parasites and Pests of Animals	5%	5%	5%	0%
313	Internal Parasites in Animals	2%	5%	5%	0%
315	Animal Welfare/Well-Being and Protection	5%	2%	2%	7%
404	Instrumentation and Control Systems	5%	0%	0%	0%
511	New and Improved Non-Food Products and Processes	3%	0%	0%	0%
512	Quality Maintenance in Storing and Marketing Non-Food Products	5%	0%	0%	0%
601	Economics of Agricultural Production and Farm Management	4%	1%	1%	1%
602	Business Management, Finance, and Taxation	3%	1%	1%	1%
604	Marketing and Distribution Practices	3%	1%	1%	1%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	60.0	3.0	105.0	8.0
Actual Paid Professional	81.0	9.0	104.0	9.0
Actual Volunteer	41.0	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
803444	447096	1517342	954409
1862 Matching	1890 Matching	1862 Matching	1890 Matching
803444	416193	1517342	625325
1862 All Other	1890 All Other	1862 All Other	1890 All Other
6185056	20400	11776275	207989

V(D). Planned Program (Activity)

1. Brief description of the Activity

This plan of work includes broad and extensive research and extension programs. NC Agricultural Research Service scientists will conduct research projects to study methods to improve the efficiency of animal production. Research will focus on methods to improve reproductive performance, nutrient utilization, and genetic influence on growth and reproduction. Scientists will also work to improve animal management systems, decrease the incidence of animal diseases and parasites (external and internal) and improve the management of animal and agricultural pests. Species and commodity groups included in this plan of work are also very broad and include poultry such as turkeys, broiler chickens, and table-egg chickens. The plan of work also includes swine, fish such as flounder, and cattle such as beef and dairy, and numerous pests such as house flies. Research will include many phases of commodity production such as meat and dairy goats, chicken breeders (both broiler and table egg birds), commercial broilers (commercial refers to those animals produced for meat), breeder turkeys, commercial turkeys, swine breeders, commercial swine, all phases of aquaculture and beef and dairy production. Disciplines that will be involved include nutrition, physiology, reproductive physiology, genetics, virology, bacteriology, microbiology, mycology, entomology, and many animal management systems such as grazing and forage management programs, hatchery management, feeding and drinking water systems, litter and bedding management, lighting programs, and breeder selection and management. A very important part of this plan of work is to transfer technology and knowledge to our stake-holders and clientele. Therefore, an extensive outreach effort through Cooperative Extension will be conducted by field and campus based faculty who are based on-site as well as being located across the state and based in local communities. Stake-holders and clientele will be directly engaged in many ways including workshops, conferences, discussion groups, one-on-one teaching, demonstrations, field days, short-courses, continuing education classes, and scientific meetings. Indirect methods to reach stake-holders and clientele will include long-distance education, newsletters, web sites, newspaper releases, television and radio programs, trade journals, scientific journals, and popular press articles. Participants and programs will be evaluated at least annually for success, progress, and effectiveness. Special educational programs focused on limited resource farmers will continue to be a priority for NC A&T focused Extension efforts in pasture based production systems, aquaculture and alternative breeds.

2. Brief description of the target audience

The target audience will be primarily aquaculture, poultry, livestock producers, small-scale limited resource, beginning and underserved growers and agribusiness personnel in North Carolina. However, since North Carolina producers are some of the best in the world, ultimately, producers and agribusiness personnel across the country and around the world will be the primary audience. In addition, the audience will include personnel in other state and federal agencies, local, state and federal politicians, and other

stakeholders including the general public.

3. How was eXtension used?

A wide array of animal systems Communities of Practice are in eXtension, providing a valuable resource for production practices, animal health and management, and marketing.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	278807	818642	42000	45000

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

Patent Applications Submitted

Year: 2012

Actual: 3

Patents listed

Methods and Compositions for improving growth of meat-type poultry

Livestock Insect-Removal Systems and Related Methods

Attenuated FNR Deficient Enterobacteria

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	7	207	214

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Highly focused non-degree credit group training activities to be conducted

Year	Actual
2012	1503

Output #2

Output Measure

- Relevant and impacts focused research projects to be conducted

Year	Actual
2012	146

Output #3

Output Measure

- Local, Area, Regional, and State Conferences to be Conducted

Year	Actual
2012	20

Output #4

Output Measure

- Local, Area, Regional, and State Educational Tours to be Conducted

Year	Actual
2012	30

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Additional income gained by animal producers improved planning, marketing, and financial practices
2	Net income increased by producers improving animal husbandry practices
3	Number of animal producers adopting improved animal husbandry practices
4	Number Livestock Producers Adopting and Applying Improved Planning and Financial Management Practices
5	Number of new technologies developed to prevent/treat animal diseases
6	New organic, farmers and agritourism markets established by individual entrepreneurs
7	Growers Adopting Improved Business Management Practices

Outcome #1

1. Outcome Measures

Additional income gained by animal producers improved planning, marketing, and financial practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	8000000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Byproduct feeds remain an important part of beef cattle feeding programs both in North Carolina and in surrounding states. Development of the ethanol industry and the resulting increase in the price of corn has increased the importance of byproducts to beef producers even more.

What has been done

Applied research showed that both dry and wet corn gluten feed are economically viable feed ingredients for use in beef finishing diets. This information has led to increased adoption of those ingredients in cattle diets. Other research exploring feeding frequency and feed sources have also impacted the profitability of byproduct utilization in the state. The extension ruminant nutrition program works both directly with producers and through extension agents to enhance and expand the use of byproducts in feeding programs.

Results

In 2012, 10,000 tons of soybean hulls, 6000 tons of dry corn gluten feed and 8,000 tons of wet corn gluten feed, and 10,000 tons of other miscellaneous byproducts were utilized by clients for a realized savings of over \$1 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals

303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

Outcome #2

1. Outcome Measures

Net income increased by producers improving animal husbandry practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	8000000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Swine and poultry growers in the Southeast must import much of the grain used in animal feed. Growers must look for every efficiency available if they are to remain competitive with Midwest growers.

What has been done

Preliminary results from a project looking at timing of an nutritional intervention to improve the reproductive capacity of sows has found evidence of a 0.28 pig/sow/year increase and a marginal increase in average litter weight in sows fed high-fiber diet compared to sows fed a standard/control diet.

Results

A 100-sow herd with access to modest amounts of dietary fiber, a producer could raise 28 more pigs per year for the same dollar amount spent on non-fiber enriched diets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Number of animal producers adopting improved animal husbandry practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	6435

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Fescue toxicosis remains the single most important production problem in the southeastern U.S., leading to an estimated \$1 billion reduction in revenue. Despite our knowledge of the problems associated with endophyte infected fescue, producers continue to use it as their primary forage due to its superior agronomic characteristics and a lack of viable options for their forage systems.

What has been done

Our recently completed long-term study comparing a new non-toxic infected fescue known as MaxQ to toxic infected fescue and endophyte-free fescue showed that non-toxic infected fescue

would provide performance similar to endophyte-free fescue while resulting in stand survival and yield similar to toxic-infected fescue. The results of this study also demonstrated that while toxic infected fescue resulted in dramatically reduced performance in the spring and summer it resulted in similar performance and higher carrying capacity than non-toxic infected or endophyte-free fescue during the winter grazing season.

Results

These results will lead to improved forage systems including non-toxic fescue for spring and early summer grazing and toxic-infected fescue for winter grazing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
315	Animal Welfare/Well-Being and Protection

Outcome #4

1. Outcome Measures

Number Livestock Producers Adopting and Applying Improved Planning and Financial Management Practices

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	5000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producers need information regarding the issue of genetics and management practices to reduce disease-associated losses.

What has been done

Field days have been conducted to provide insight into genetic differences between species and management practices that aid in reducing disease and species-associated losses.

Results

This activity has increased awareness of opportunities for economic benefit through diversification of enterprises and from adoption of improved management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
315	Animal Welfare/Well-Being and Protection

Outcome #5

1. Outcome Measures

Number of new technologies developed to prevent/treat animal diseases

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

New organic, farmers and agritourism markets established by individual entrepreneurs

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1092

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Selling value-added products at farmer's markets or other stores can increase income for entrepreneurs but the regulations surrounding these products can be confusing. Entrepreneurs often need assistance navigating the regulatory framework and the food safety expertise to ensure safe products are manufactured.

What has been done

The Entrepreneurial Assistance Program seeks to help entrepreneurs or businesses in North Carolina and beyond ensure their food products are safe and meet regulatory guidelines. Food product testing for safety parameters and nutritional labeling are the two main services provided in conjunction with general advising and answering questions on the multitude of topics of importance to a food entrepreneur.

Results

In 2012, the Entrepreneurial Assistance program provided product testing and/or nutritional labeling services to approximately 420 customers, resulting in about 710 products tested and 530 products labeled.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

Outcome #7

1. Outcome Measures

Growers Adopting Improved Business Management Practices

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Rapidly changing environmental and economic conditions (weather extremes, economic climate) influence producers' abilities to adapt to change while ensuring sustainable production systems. Continued effects of the economy on federal, state and local support for research and extension programs continue to challenge our research and extension enterprises. Likewise, regulatory and other governmental policies and rules influence the educational and research capacities of our programs and present challenges to producers, processors and marketers to comply with new and often expensive regulations. And in an environment of reduced funding, the program competition for existing funds becomes a greater challenge to manage. Nevertheless, emphasis is placed on those research and extension opportunities that have the greatest effect on sustainability of farms, families and businesses, i.e., economic, environmental and social and quality of life viability.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Information in this report is compiled from North Carolina Cooperative Extension reporting system, faculty activity reports and impact statements, Office of Technology Transfer and the business offices at the two institutions. The data indicate that, despite continuing budget challenges, our research and extension programs continue to reach significant segments of our audience with relevant research and extension information that has benefit to their enterprises. Based on the impact statements, publications and patents filed, our research and extension faculty on the two campuses and across the state continue to foster and lead change.

Key Items of Evaluation

Research and extension programs have presented North Carolina agriculture with new production strategies and enterprises, more efficient production systems, and expanded opportunities for more efficient, profitable and competitive operations.