

Food and Non-Food Products: Development, Processing, Quality, and Delivery--research

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Food and Non-Food Products: Development, Processing, Quality, and Delivery--research

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	0%	0%	22%	
502	New and Improved Food Products	0%	0%	27%	
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	20%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	0%	0%	31%	
Total		0%	0%	100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	11.5	0.0
Actual	0.0	0.0	5.8	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	265629	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	265629	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	265629	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Conduct research experiments •Partner •Work with stakeholders in processing areas to create and construct research facilities

2. Brief description of the target audience

State, national and international stakeholders affected by food and non-food developing, processing, quality and delivery. These may include but are not limited to:

•producers •regulatory bodies •consumer groups

V(E). Planned Program (Outputs)

1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	0	0	0	0
2008	0	0	0	0

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

Patent Applications Submitted

Year Target

Plan: 1

2008: 6

Patents listed

Method and Apparatus for Measuring Oxygen Transmission Rate (OTR) of Perforated Thin Films

Liquid Nutrient Composition for Improving Performance

Xylan-Utilization Regulon for Efficient Bioprocessing of Hemicellulose

Device to Passively Maintain Constant Relative Depth in Liquids

Improved Klebsiella Oxytoca for Ethanol Production

The Use of Hypotaurine and Related Compounds to Inhibit Enzymatic Browning in Food

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	20	
2008	0	27	27

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

{No Data Entered}

Not reporting on this Output in this Annual Report

Year	Target	Actual
2008	{No Data Entered}	{No Data Entered}

V(G). State Defined Outcomes

O No.	Outcome Name
1	Develop improved food processing technologies Develop new food products Develop better methods of food harvesting, processing, storage and marketing of food products Develop better methods of food safety including in the area of bioterrorism

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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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

- Natural Disasters (drought, weather extremities, etc.)
 - Economy
 - Appropriation changes
 - Government regulations
 - Competing Public priorities
 - Competing Programatic Challenges

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

1. Evaluation Studies Planned

After Only (post program)

Retrospective (post program)

Before-After (before and after program)

During (during program)

Time series (multiple points before and after program)

Case Study

Comparisons between program participants (individuals,group,organizations) and non-participants

Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

The Poultry Food System: A Farm to Table Model

There are an estimated 60 to 80 million individuals who contract foodborne illness each year leading to approximately 5,000 deaths. The annual costs of foodborne illness in the U.S. are estimated at from \$5 to \$6 billion, including both medical costs and productivity losses. A significant percentage of these illnesses is due to pathogenic bacteria associated with poultry meat. In addition, the maintenance of poultry quality and development of poultry products that can assist in meeting the needs of inhabitants in undeveloped as well as developed countries is a top priority of this project. The intent of this multistate regional research is to efficiently use the capabilities of the cooperators and their respective facilities to achieve the project objectives that address current regional, national and global priorities that relate to poultry meat safety, quality and new product development.

The project involved the evaluation of antimicrobials for anti-Listeria properties for application in ready-to-eat poultry products. Natural food grade antimicrobials for use as anti-Listeria agents in ready to eat poultry products were evaluated. The antimicrobials included nisin, rosemary extract and EDTA. Dissemination of the results of this work has included professional conferences, and preparation of refereed journal articles. PARTICIPANTS: Individuals who worked on the project included Alba Ruiz and Noufoh Djeri, Master of Science graduate students. Partner collaborators included Arthur Hinton, Ph.D., USDA ARS, Athens, GA, and Gary Rodrick, Ph.D., Food Science and Human Nutrition Department, University of Florida. The collaborators provided microbiological expertise. This project was the Master of Science research project of Alba Ruiz. She gained extensive hands-on experience in microbiological techniques for the control of *Listeria monocytogenes* in poultry products.

Antimicrobial properties of nisin increased with increasing concentrations. The optimum usage level of nisin was 0.5%. Rosemary extract and EDTA exhibited limited anti-Listerial effects when applied alone or in combination with nisin.

Key Items of Evaluation

High quality seed is key to crop production; environmental factors such as high temperature and poor germination can reduce seed quality. All areas of production including stand establishment, sustainability, and seed storage will be the focus of this study to improve and provide answers to problems faced by seed producers and growers. Achene (seed) anatomy of five native *Coreopsis* species, *C. basalis*, *C. floridana*, *C. lanceolata* (four sources), *C. leavenworthii*, and *C. pubescens* were studied in an attempt to identify regulators of seed dormancy. Seeds were examined using light microscopy, scanning electron microscopy (SEM) and fluorescence microscopy. Seeds of all species had a woody pericarp, testa and a single cell-layer of endosperm surrounding the dicotyledonous embryo. In germination studies, the endosperm and pericarp were implicated in coat-enhanced seed dormancy. The pericarp and endosperm of *C. floridana* and *C. lanceolata* seeds play a significant role in seed dormancy regulation and impose thermo-inhibition at supra-optimal temperatures. Seeds of the wildflower *Coreopsis lanceolata* have been reported to exhibit dormancy. Studies were conducted to identify factors imposing dormancy. The effects of potassium nitrate, seed tissues enveloping the embryo, gibberellic acid (GA4 plus 7), temperature, afterripening period (dry storage at 10 deg C) and cold stratification were investigated in the germination of freshly harvested seeds. Carrot (*Daucus carota*) seed germination and consequently stand establishment may be reduced under temperatures above 35 deg C. Various priming treatments were tested and respiratory activity measured. Stand establishment may be improved, especially during high temperatures, with use of well developed carrot seed and priming. By determining not only the achene anatomy of native *Coreopsis* species, but also by identifying factors imposing dormancy and how to overcome them, native plant species have a better ability to become established wherever desired. Current plans involve the use of native *Coreopsis* species to replant or fill in locations of roadway easements so that mowing is reduced, soil moisture content is maintained and erosion is minimized. Improvements with carrot seed production and priming may allow production of the species in locations not highly desired by the carrot industry.