V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Foods and Nutrition

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
204	Plant Product Quality and Utility (Preharvest)			13%	
308	Improved Animal Products (Before Harvest)			3%	
501	New and Improved Food Processing Technologies			13%	
502	New and Improved Food Products			9%	
503	Quality Maintenance in Storing and Marketing Food Products			3%	
701	Nutrient Composition of Food			6%	
702	Requirements and Function of Nutrients and Other Food Components			20%	
703	Nutrition Education and Behavior			15%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources			6%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins			12%	
	Total			100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.0	0.0
Actual	0.0	0.0	4.1	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	253647	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	508564	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

Conduct research experiments; publish peer-reviewed articles and other types of publications; create and test new food products; develop and test nutrition interventions; develop new methods to test for food-borne pathogens and pesticide residues; develop databases

2. Brief description of the target audience

Scientists; extension educators; policy makers; specialty food producers; seafood processors; fruit and vegetable farmers; students; nutritionists; consumers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	9	
Actual	0	8	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of other publications

Year	Target	Actual
2010	7	13

Output #2

Output Measure

- # of papers presented at meetings

Year	Target	Actual
2010	20	7

Output #3

Output Measure

- # of completed research projects

Year	Target	Actual
2010	0	0

Output #4

Output Measure

- # of crustacean mince-based products commercialized

Year	Target	Actual
2010	0	0

Output #5

Output Measure

- # of simple, inexpensive, instrument-free gaseous ClO2 approach for disinfection of fresh produce

Year	Target	Actual

2010	{No Data Entered}	1

Output #6

Output Measure

- # of web-based interventions to improve diets and overall health of young adults piloted (Y.E.A.H. Project--Young Adults Eating and Active for Health).

Year	Target	Actual
2010	{No Data Entered}	1

Output #7

Output Measure

- The NC1028 researchers in collaboration with Interactive Training Technologies, Inc, a multimedia/web-based training corporation, developed the website which includes educational modules (activities); staged-based messages (nudges) delivered as emails and web-based videos, personalized goal setting and tracking of progress.

Year	Target	Actual
2010	{No Data Entered}	1

Output #8

Output Measure

- Glycoalkaloid (TGA) analysis for several potato breeding programs around the country. MAFES scientists have maintained their service of TGA screening for these researchers and have expanded capabilities to help the potato and pet food industries test dried potato meal for TGA levels.

Year	Target	Actual
2010	{No Data Entered}	0

Output #9

Output Measure

- A capsicum cultivar with high levels capsinoids, novel phytochemicals with beneficial health effects. As a joint project with the USDA-ARS. This is the first year of selective breeding for this cultivar and scientists are excited by the capsinoid levels obtained in the fruit from the new plants.

Year	Target	Actual
2010	{No Data Entered}	1

Output #10

Output Measure

- Amount of extramural funding awarded to faculty working in this program area during university fiscal year 2010

Year	Target	Actual
2010	{No Data Entered}	777885

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of new analytical methods for detecting phytocompounds in foods
2	# of Maine food processors learning about new methods to detect pesticide residues
3	Increase in consumption of fruits and vegetables by targeted young adults
4	Decrease in obesity among young adults taking part in nutrition education program
5	# of food products incorporating nutrition claims of interest to consumers
6	# of new extruded food products containing anthocyanins
7	Number of people newly aware of the health benefits of potatoes
8	Percentage increase in wild blueberry sales
9	Percentage of Maine adults who are overweight or obese
10	Increased use by Maine's blueberry industry of claims of cardiovascular health benefits of wild blueberry consumption
11	Increase in number of Maine crustacean processors producing and/or selling mince
12	New markets for elderberry producers
13	New analytical methods for monitoring organic chemicals in food, water and environmental matrices
14	# of seafood researchers, fishermen, and economic development specialists increasing their knowledge about using the invasive green crab in new food products

Outcome #1

1. Outcome Measures

of new analytical methods for detecting phytocompounds in foods

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	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
701	Nutrient Composition of Food
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #2

1. **Outcome Measures**

   # of Maine food processors learning about new methods to detect pesticide residues

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Increase in consumption of fruits and vegetables by targeted young adults

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

   Decrease in obesity among young adults taking part in nutrition education program

2. **Associated Institution Types**

   - 1862 Research

3a. **Outcome Type:**

   Change in Condition Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2010	0	0

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

Issue (Who cares and Why)
Risks of cardiovascular disease, hypertension, and type 2 diabetes are exacerbated by excessive weight gain. Specific strategies are needed to promote healthful eating among young adults, an age group with high risk of weight gain and unique interests in diet/health issues. To date, few interventions have been designed for obesity prevention among young adults.

What has been done
During this year the goal was to develop tailored weight management applications, addressing young adults' eating and physical activity patterns, which incorporate behavioral theoretical

constructs and individualized factors that can be refined and evaluated in future projects. A web-based intervention, Y.E.A.H. Project (Young Adults Eating and Active for Health), was piloted and retested in preparation for actual implementation.

Results
: Over this year the partnership between the researchers and the community members at the Job Corps site has strengthened, which increases the sustainability of the project. The researchers found that the Behavior, Environment and Changeability Survey (BECS) may be useful for nutrition educators, researchers and community program designers to understand the needs of a young adult population and provide targeted interventions/programs aimed at preventing obesity in this age group. Specifically, use of the BECS can help identify factors that enable and encourage healthful eating and physical activity. This partnership with the Penobscot Job Corps is resulting in environmental changes and a system of support to promote behavior change. The result will be a sustainable program for healthful lifestyles, reduced risk of chronic disease and improved quality of life for 18- to 24-year-olds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

# of food products incorporating nutrition claims of interest to consumers

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

# of new extruded food products containing anthocyanins

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	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
502	New and Improved Food Products
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #7

1. Outcome Measures

Number of people newly aware of the health benefits of potatoes

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Percentage increase in wild blueberry sales

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Percentage of Maine adults who are overweight or obese

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Increased use by Maine's blueberry industry of claims of cardiovascular health benefits of wild blueberry consumption

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Cardiovascular disease still remains the leading cause of death in the U.S. despite a steady decline in lives claimed during the past two decades. Various studies have produced substantial evidence linking the consumption of antioxidant-containing fruits and vegetables to reduced risk of cardiovascular disease and improved cardiovascular health. Maine?s wild blueberries are a rich source of potent antioxidants including phenolics acids, tannins, flavonols and anthocyanins. Determining the health benefits of blueberries may have great economic impact on the blueberry industry by increasing marketability and blueberry consumption.

What has been done
MAFES nutritionists fed spontaneously hypertensive rats a control or a wild blueberry diet for eight weeks. After the eight weeks of intervention, the rats were exposed to the compound l-phenylephrine (a vasoconstrictor), with or without l-NG-monomethyl arginine, a compound known to inhibit the enzyme NO synthase (NOS). The scientists found that animals fed a diet supplemented with 8 percent wild blueberries experienced less constriction in blood vessels, compared with animals fed a control diet.

Results
The researchers have found that the high levels anthocyanins, the blue pigment coloring blueberries, introduced through regular consumption of wild blueberries or blueberry extracts, can protect DNA molecules and reduce damage by approximately 30 percent. Supplementing the diet with antioxidant-rich wild blueberries could also benefit human beings with high blood pressure. This research has been featured on the Maine Wild Blueberry Commission?s web site and has been reported in many Maine newspapers and cited in an article on the NutraIngredients-USA.com website, a daily online health and nutrition news service.

4. Associated Knowledge Areas

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

Outcome #11

1. Outcome Measures

Increase in number of Maine crustacean processors producing and/or selling mince

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
One of Maine's greatest natural resources, and a major contributor to the state's economy, is the sea. The survival of the seafood and aquaculture industries, in Maine and throughout the U.S., is tied to their long-term economic and environmental sustainability. This proposal will focus on research and development to support the economic and environmental sustainability of the crustacean (crab and lobster) processing and aquaculture industries in Maine.

What has been done
: MAFES food scientists have been developing economically feasible methods of using the green crab (Carcinus maenus) in new food products, to help establish a new fishery for this invasive species and turn it into a valued food resource. Working on two studies, they evaluated the mechanical processing of the green crab and also produced and consumer-tested an empanada containing the green crab mince as a primary ingredient.

Results
They found that it is possible to mechanically process green crabs, with a resulting high mince yield with a low crude lipid content. These results indicate that green crab would be economically viable in processing operations and would retain its quality during extended periods of frozen storage. Results from the empanada test showed that 63% of the panelists would probably or definitely buy green crab and vegetable empanadas if they were available to them locally. In the short term, this project resulted in harvest income for a Maine lobsterman, and the removal of several thousand of these invasive animals from in-shore areas.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #12

1. Outcome Measures

New markets for elderberry producers

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Small business, including those in the agriculture and biotechnology fields constitute the backbone of Maine's economy. Value-added contributions from the agriculture community leverage these positive impacts, including increased revenues and several employment opportunities for rural workers.

What has been done
MAFES food scientists continued use their analytical expertise and resources to help Maine?s agricultural and biotech industries grow and find new markets for their products.

Results
Their collaborative approach has helped an elderberry producer launch an elderberry extract that is currently distributed through a major U.S. retailer. A recently funded (USDA) project will allow a joint project to develop other food products with this Maine company.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #13

1. Outcome Measures

New analytical methods for monitoring organic chemicals in food, water and environmental matrices

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Small business, including those in the agriculture and biotechnology fields constitute the backbone of Maine's economy. Value-added contributions from the agriculture community leverage these positive impacts, including increased revenues and several employment opportunities for rural workers.

What has been done
MAFES food scientists continued use their analytical expertise and resources to help Maine?s agricultural and biotech industries grow and find new markets for their products.

Results
Their work with a small Maine biotech firm in the area of melamine/cyanuric acid analysis has helped the firm to refine its rapid assay kit and has lead to the creation of several well-paid scientific research jobs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #14

1. Outcome Measures

of seafood researchers, fishermen, and economic development specialists increasing their knowledge about using the invasive green crab in new food products

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results
At least 100 seafood researchers, local fishermen, and economic development specialists became more knowledgeable about this potential method of mitigating the green crab invasion, and future collaborative research efforts have been discussed.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

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.)
- Other (new threats to food safety)

Brief Explanation

{No Data Entered}

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

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of progra intensity.

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}