

V(A). Planned Program (Summary)**Program # 7****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
123	Management and Sustainability of Forest Resources	0%		2%	
124	Urban Forestry	0%		2%	
125	Agroforestry	0%		7%	
133	Pollution Prevention and Mitigation	0%		4%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		2%	
215	Biological Control of Pests Affecting Plants	0%		2%	
216	Integrated Pest Management Systems	0%		2%	
305	Animal Physiological Processes	0%		3%	
311	Animal Diseases	0%		15%	
501	New and Improved Food Processing Technologies	0%		17%	
502	New and Improved Food Products	0%		2%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		15%	
511	New and Improved Non-Food Products and Processes	0%		2%	
701	Nutrient Composition of Food	0%		7%	
703	Nutrition Education and Behavior	0%		1%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	30%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	70%		0%	
724	Healthy Lifestyle	0%		13%	
806	Youth Development	0%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	0.2	0.0	6.0	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
15628	0	313817	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
46021	0	261850	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	43238	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Food Preservation, Safety and Sanitation: knowledge of food safety and improve food handling practices
- Research proposal to increase the resilience to disasters of mobile home parks in the rural state of Vermont.
 - Effort to provide data to public concerning Vermont plants, both native and introduced.
 - Genetic profiling to assess crops for conservation and improvement
 - Analysis of distribution of genetic diversity in the fiddlehead fern; a seasonable vegetable product harvested throughout Vermont with significance to Vermont fresh network food industry
 - Examine how the current distribution of New England forests has been affected by recent climate change and predict how these forests will change in response to future climate change
 - Provide the background research necessary for Vermont's citizens and legislators to make informed decisions about VCAT (Vermont Common Assets Trust), VCAT would make the state's atmosphere, aquifers and other common assets the common property of all Vermonters.
 - Improve detection of L. monocytogenes (a foodborne disease that mainly targets people with compromised immune system) through use of improved enrichment strategies, improved sampling techniques and use of Fourier transform infrared (FT-IR) microspectroscopy.
 - Control Oomycetes, a plant disease, to crops and fruit species
 - Investigate the effect of earthworms on the distribution of soil organic matter and the mobilization of nutrients in sugar maple forests.
 - Increase understanding on the effects of different environmental conditions as well as the mechanism of the plant response
 - Examine the production of health capital as measured by a healthy weight in a sample of single headed households with children
 - Determine if multiple introductions of agronomically important strains of the grass, Phalaris arundinacea, reed canary grass have a greater potential to be aggressive and withstand climatic

fluctuations.

- Evaluate cultural management procedures for plant-parasitic nematodes in relation to their impacts on the sustainability of soil health (good soil health crucial to Vermont farming)
- Study of mammary epithelial cells, their number and state of differentiation are correlated with milk quality and yield.

The work proposed here is an expanded analysis of the distribution of genetic diversity in the fiddlehead fern (*Matteuccia struthiopteris*), a seasonable vegetable product harvested from the wild throughout Vermont with significance to the local Vermont-fresh-network food industry. The work proposed here is an expanded analysis of the distribution of genetic diversity in the fiddlehead fern (*Matteuccia struthiopteris*), a seasonable vegetable product harvested from the wild throughout Vermont with significance to the local Vermont-fresh-network food industry.

2. Brief description of the target audience

- Adults
- Age 25 - 60 Adult

- Vermont farmers
- Scientific community
- General public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	400	0	100	0

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

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 1

Patents listed

Whey-protein based environmentally friendly wood adhesives

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Consultation

Year	Target	Actual
2010	{No Data Entered}	116

Output #2

Output Measure

- Publication - newsprint

Year	Target	Actual
2010	{No Data Entered}	16

Output #3

Output Measure

- Food Preservation & Safety Workshop

Year	Target	Actual
2010	{No Data Entered}	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people who show improvement in food safety and preservation practices
2	Produce human insulin in cow milk, an essential medicine for the treatment of diabetes.
3	Enhance the quality and marketing posture of cheddar cheese produced annually.

Outcome #1

1. Outcome Measures

Number of people who show improvement in food safety and preservation practices

2. Associated Institution Types

- 1862 Extension

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)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

Produce human insulin in cow milk, an essential medicine for the treatment of diabetes.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition 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)

Biopharmaceutical proteins by the mammary glands of genetically modified transgenic cows (dairy pharming) is currently under extensive exploration because it promises to provide high quality therapeutic medicine for humans.

What has been done

Attempts have been made to clone the human insulin gene into the pBC1 vector without success and are trouble shooting the possible cause of the problem. Additionally, the bovine beta-casein gene structure has been analyzed.

Results

Project will develop innovative ways to dramatically reduce the cost associated with production of transgenic cows and with a higher success rate. Goal is to locate specific DNA sequences that confer resistance to mastitis and will allow early selection of sires to be used in subsequent breeding programs. Human insulin gene and cDNA have been successfully obtained.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Enhance the quality and marketing posture of cheddar cheese produced annually.

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}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Calcium lactate (CL) crystal formation is a widespread and costly problem for Cheddar cheesemakers in Vermont.

What has been done

Aim of project is to use a computer vision image analysis method that was recently developed in the laboratory to study the causes and mechanisms of calcium lactate crystal formation on Cheddar cheese. First objective was to systematically study various factors during cheese storage and distribution. Results indicate that these post-manufacture factors are problematic.

Results

Major finding is that post manufacture factors such as low storage temperature and loose packaging that elevate the risk of calcium lactate crystal defects on Cheddar cheese do not affect the rate at which crystals grow but do affect the number of crystals that form on the surface over time. The effects of the post-manufacture conditions have been identified as causing increased risk of crystallization will be evaluated and compared: storage temperature: 1C; 5C; 10C; Tightness of vacuum packaging film: 960mbar (extremely loose); 70 mbar(loose); 10 mbar (extremely tight);. Packaging type: vacuum packaging; CO2 gas flush packaging.

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Competing Programmatic Challenges

Brief Explanation

Extension experienced the retirement of its faculty member who conducted most of the Food Safety programming.

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

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}