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	50%		50%	
502	New and Improved Food Products	5%		5%	
503	Quality Maintenance in Storing and Marketing Food Products	25%		25%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		20%	
	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
Plan	1.5	0.0	0.5	0.0
Actual	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	63204	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	63204	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

A study to evaluate the microbial loads of skinless, boneless chicken breasts (10 per treatment) marinated in Kraft Italian salad dressing at room temperature (22-25ºC) for 1, 2 and 3 hours was completed. Total aerobic and coliform loads and Escherichia coli loads were determined before and after marinating for the designated length of time using a swab technique and PetrifilmJmicrobial plates. The microbial loads of the Italian dressing were also evaluated. The major impact from this research could be a reduction in the risk of foodborne illness from contaminated meats which may be subsequently undercooked.

Spices including dried chile pepper have been found to be contaminated with Salmonella spp. Detection of Salmonella spp. is based on conventional enrichment and isolation on selective media. Since traditional methods are time consuming and labor intensive, rapid and automated methods have been developed, but few evaluated for Salmonella detection in chile powder. Previous studies determined the rapid methods to use in the detection of Salmonella in dried red chile pepper and the other was to assess the accuracy of these methods at two inoculation levels of Salmonella artificially contaminated in red chile pepper. The VIDAS SLM method and the Neogen Reveal Device when used with the BAM pre-enrichments were equally effective compared with the BAM method for detecting Salmonella in red chile pepper powder. However, the Neogen Reveal Salmonella System was significantly less effective ($p > 0.05$) than the BAM method for Salmonella detection at the low inoculum level. Fermented chile pepper mash (Capsicum annuum cv. Mesilla Cayenne) is a major industrial food product in New Mexico. The fermentation of chile pepper mash depends on temperature, acidity, salt concentration, dissolved air, available carbohydrate and enzymes. The microbial flora involved in pepper mash fermentation has not been fully characterized. The objective of this study was to evaluate the effects of calcium chloride ($CaCl_2$) level on microbial characteristics of cayenne chile pepper mash fermentation. Nine 5 gal buckets were prepared with pepper washed and ground by the manufacturer with 15g/100g of sodium chloride and were allotted randomly to 1 of 3 treatments. Treatments were no added $CaCl_2$; 0.02g/100g and 0.04g/100g $CaCl_2$ added to the pepper mash. Aerobic plate count (Petrifilm or plate count agar), coliform counts, E. coli counts, enterobacteriaceae counts, yeast, mold and lactobacillus were not affected by $CaCl_2$ level. However, streptococcus spp. tended to linearly decrease ($P= 0.06$) with increasing $CaCl_2$ level. These results indicate that streptococci spp. might be the only microbe affected by $CaCl_2$ level. Viscosity, acidity, alcohol, soluble sugar, water activity and refractive color were not affected ($P>0.10$) by $CaCl_2$ level. However, lightness tended to decrease ($P=0.08$) while red intensity, blue intensity, contrast and hue decreased ($P <0.05$) with increasing $CaCl_2$ level. These results suggest that $CaCl_2$ added to salted pepper mash only affects color characteristics. Traditional methods of detecting microorganisms in food are time consuming and labor intensive, rapid and automated methods that have been developed must be tested in various food products. Although these rapid methods still require confirmation, the VIDAS SLM procedure was a reliable screening procedure combined with BAM Salmonella selective enrichment broth to detect Salmonella in dried red chile pepper powder. Utilizing rapid methods will improve both food processor and health official response time in the event of a food born illness associated with dried red chile pepper powder. The fermentation of chile pepper mash depends on many factors such as temperature, air, available carbohydrate and microflora is a natural process that has not been fully characterized for industrial processing. Calcium chloride is used to maintain firmness in jalapeno peppers. The theory is that added calcium can block pectin esterase activity and interact with pectin to improve viscosity and maintain soluble solids in the final pepper sauce. Additionally, the effect of calcium on microflora and microbiological characterization of lactic bacteria involved in fermentation can impact the industrial processing of pepper mash

2. Brief description of the target audience

Small food processors and families.

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	1	1	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- The specific output measures will vary according to the specific project being monitored. The development of research procedures and technology, training of students, publishing research papers, and disseminating research results via educational workshops, conferences, and Extension media are important outputs for the various projects falling under this planned program.

Year	Target	Actual
2010	0	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of trained professionals
2	# of research publications
3	# of Extension publications
4	% of food processors using NMSU for their food product development

Outcome #1

1. Outcome Measures

# of trained professionals

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

# of research publications

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	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

Outcome #3

1. Outcome Measures

# of Extension publications

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	3

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

Outcome #4

1. Outcome Measures

% of food processors using NMSU for their food product development

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

Brief Explanation

The economy had the greatest impact on programs, due to appropriations allocations.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}