

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Program in Food Science

**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			25%	
502	New and Improved Food Products			14%	
503	Quality Maintenance in Storing and Marketing Food Products			11%	
702	Requirements and Function of Nutrients and Other Food Components			10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins			40%	
	<b>Total</b>			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	13.0	0.0
Actual	0.0	0.0	21.8	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	0	35911	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	35911	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	2338187	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

In recent years, the cost of production and competition from international players in conventional agricultural commodities has increased. Washington producers, because of logistics, cost of production and increasing environmental and regulatory requirements, are becoming less competitive in many commodity markets. The School of Food Science is providing scientific and technical information that will assist producers and processors to develop profitable new foods and new markets for healthy foods. Health promoting functional foods will include foods that can reduce the risk of cancer and provide healthy food choices. Furthermore, the College of Agricultural, Human and Natural Resources Sciences is poised to provide this assistance to the state agricultural community by building upon existing strengths within the College regarding the production, processing and utilization of a variety of important food products as well as in the area of sustainable organic agriculture and consumer education. The presence will bolster community outreach aspects of the food science program.

**2. Brief description of the target audience**

Food producers, processors, packers, peers, professionals, industry, and consumers

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	6	3	0	0
<b>Actual</b>	3610	4100	160	80

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 3  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	4	30	
<b>Actual</b>	10	59	69

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Peer reviewed journal publications

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	26	59

**Output #2**

**Output Measure**

- Graduate students supported by experiment station funding and grants

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	12	13

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Investigation of rapid detection systems for food contamination.
2	Investigation of novel food processing and storage methods
3	Scientists and companies would use the information we have published to further their research and food production practices
4	Rapid detection systems move to a pilot plant testing phase.
5	Information in published research is incorporated into production practices thus improving the safety of the food supply.
6	Novel rapid detection methods for food pathogens become available to the food and processing industries improving the safety of the food supply

**Outcome #1**

**1. Outcome Measures**

Investigation of rapid detection systems for food contamination.

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Investigation of novel food processing and storage methods

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	4	0

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

**Issue (Who cares and Why)**

The food industry to improve food quality and safety.

**What has been done**

In a partnership with faculty in Biosystems Engineering, thermal and nonthermal technologies were evaluated for improving food quality of selected processed foods while keeping them safe for consumption. In general, food engineers focus on the process while food scientists evaluate the effect of the new process on food quality and safety. In thermal processing, the study of microwave (MW) technology continued by comparing the advantages of this process with the conventional thermal treatment for processing salmon and mashed potatoes. The microwave sterilization process developed at WSU received formal approval by the U.S. Food and Drug Administration using salmon as the test product. Meanwhile in the area of nonthermal technologies, Pulsed Electric Fields (PEF) was explored in depth while testing milk, milk products, and grape juice. The microbial inactivation/activation of selected microorganisms (including spores) received specific attention. Some changes in other components of these food products (color and flavor) and possible changes in the electrode of the system were also investigated. Studies were also conducted using high hydrostatic pressure (HHP) in some milk and flavored

milk and ultrasound (US) in dairy products such as yogurt and milk, as well in some selected juices such as orange and peach.

**Results**

Improve safety and quality of products for the consumer. Improve energy efficiency of food processes.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

**Outcome #3**

**1. Outcome Measures**

Scientists and companies would use the information we have published to further their research and food production practices

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	12	10

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

**Issue (Who cares and Why)**

Improving the safety and quality of food.

**What has been done**

WNP716. Control of foodborne pathogens in pre- and post-harvest environments. Research provided unique and valuable insights on the relationship between indicator organism levels and pathogen risk throughout a farm environment, including irrigation water, composting, and crop systems. These results were communicated to growers and led to specific recommendations regarding farming practices, including composting, and irrigation methods. Research to identify antimicrobial compounds to reduce pathogen risk in organic leafy greens production systems was initiated. A peroxyacetic acid rinse was found to have antimicrobial activity when used during fresh, whole apple packing. Lactic acid was an effective alternative to chlorine during mobile poultry slaughter. Interest from meat processors in three states was received regarding use of the lactic acid rinse.

**Results**

These results were communicated to growers and led to specific recommendations regarding farming practices, including composting, and irrigation methods. Interest from meat processors in three states was received regarding use of the lactic acid rinse.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #4**

**1. Outcome Measures**

Rapid detection systems move to a pilot plant testing phase.

Not Reporting on this Outcome Measure

**Outcome #5**

**1. Outcome Measures**

Information in published research is incorporated into production practices thus improving the safety of the food supply.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	1	0

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

**Issue (Who cares and Why)**

The food industry in Washington State, the US and all consumers.

**What has been done**

Training in Hazard Analysis Critical Control Points, safe quality foods, food sanitation, and Good Agricultural Practices (GAP's). Research on food microbiology is included into these programs.

## Results

Safer food production which translates to a safe food supply for consumers. Changes in food handling and packaging processes in the industry to prevent foodborne illness.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

### Outcome #6

#### 1. Outcome Measures

Novel rapid detection methods for food pathogens become available to the food and processing industries improving the safety of the food supply

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
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

#### Brief Explanation

In addition to external factors commented on elsewhere, an issue directly related to the Food Science program was the delays that budget constraints in both Idaho and Washington caused in recruiting a new chair for the joint bi-state department. This recruitmant was successful in 2010 and should make it more feasible to articulate the capabilities and direction to be taken in the future.

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

#### 1. Evaluation Studies Planned

- Other (See below)

## **Evaluation Results**

### **Key Items of Evaluation**