V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program
Food and Non-food Products, Development, Processing, Quality and Delivery

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>New and Improved Food Processing Technologies</td>
<td>40%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502</td>
<td>New and Improved Food Products</td>
<td>33%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>511</td>
<td>New and Improved Non-Food Products and Processes</td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

V(C). Planned Program (Inputs)

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

<table>
<thead>
<tr>
<th>Year: 2009</th>
<th>Extension</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1862</td>
<td>1890</td>
</tr>
<tr>
<td>Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

<table>
<thead>
<tr>
<th>Extension</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith-Lever 3b &amp; 3c</td>
<td>Hatch</td>
</tr>
<tr>
<td>41945</td>
<td>212334</td>
</tr>
</tbody>
</table>

1862 Matching |
0

1890 Matching |
1862 All Other |
334434
0

1890 All Other |
0

V(D). Planned Program (Activity)

1. Brief description of the Activity

SDSU will develop a biofuels initiative that includes research, Extension and teaching programs.
Research processes using the latest technology to improve the utilization of by-products for food and non-food products.
Connect producers, processors, end users, regulatory officials, economic development professionals, marketing specialists, researchers and extension personnel to integrate the development and delivery of food and non-food products.

2. Brief description of the target audience

Biofuels producers
Producers &mdash all types of agriculture.
Youth Organizations
Gardeners
Cottage Industry
Processors &ndash use products produced in both South Dakota, and neighboring states.
End Users (includes retail and consumers)

V(E). Planned Program (Outputs)

1. Standard output measures

<table>
<thead>
<tr>
<th>2009</th>
<th>Direct Contacts Adults</th>
<th>Indirect Contacts Adults</th>
<th>Direct Contacts Youth</th>
<th>Indirect Contacts Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>75</td>
<td>275</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Actual</td>
<td>1500</td>
<td>20000</td>
<td>1500</td>
<td>5000</td>
</tr>
</tbody>
</table>

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

Patent Applications Submitted

Year: 2009
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

<table>
<thead>
<tr>
<th>2009</th>
<th>Extension</th>
<th>Research</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Actual</td>
<td>10</td>
<td>16</td>
<td>26</td>
</tr>
</tbody>
</table>

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects completed on food/non-food products

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
### V. State Defined Outcomes Table of Content

<table>
<thead>
<tr>
<th>O. No.</th>
<th>OUTCOME NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of producersprocessors/end users working with SDSU for research and/or Extension programs related to the development, processing, quality and/or delivery of food or non-food products.</td>
</tr>
<tr>
<td>2</td>
<td>Number of producers/processors/end users using the research and educational tools developed by SDSU and their collaborators to make decisions related to the development and delivery of the identified food or non-food item.</td>
</tr>
<tr>
<td>3</td>
<td>Number of producers/processors/end users that have developed and are delivering a product impacts the economic/quality of life for the people of South Dakota.</td>
</tr>
</tbody>
</table>
Outcome #1

1. Outcome Measures

Number of producers/processors/end users working with SDSU for research and/or Extension programs related to the development, processing, quality and/or delivery of food or non-food products.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A lifelong interest in food production often starts in elementary school. The 4-H program offers targeted learning opportunities to help young people learn about careers in food production.

What has been done

The 4-H Horticulture Judging program underwent major changes, leading to a program that challenges youth to increase their understanding of horticulture and to develop knowledge and skills that would prepare them to be anything from hobbyists to scientists.

Results

50% of youth participating in the State 4-H Horticulture Judging Contest say their interest in a horticultural career has increased because of what they have learned through 4-H horticulture judging activities

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>New and Improved Food Processing Technologies</td>
</tr>
<tr>
<td>502</td>
<td>New and Improved Food Products</td>
</tr>
<tr>
<td>511</td>
<td>New and Improved Non-Food Products and Processes</td>
</tr>
</tbody>
</table>

Outcome #2

1. Outcome Measures

Number of producers/processors/end users using the research and educational tools developed by SDSU and their collaborators to make decisions related to the development and delivery of the identified food or non-food item.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure
3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**
Due to the national economic downturn, there has been a resurgence of interest in topics regarding practicality for and methods of home food preservation as a way of preserving food products and economizing food dollars. Information requests indicated the need for education regarding proper canning procedures.

**What has been done**
*3 professional development food preservation workshops reached 26 Extension educators.*
*Updated and revised 6 food preservation fact sheets with an NDSU Extension food safety specialist.*
*33 food preservation programs and workshops were held statewide: Emphasis focused on use of updated preservation directions, times, drying and freezing, checking equipment for safety and reliability, proper storage of canned goods, and hands-on experience with boiling water bath and pressure canning.*
*Updated instructions were shared with 4-H food preservation and county fair open class judges.*
*1,058 individuals participated in food preservation workshops and programs throughout South Dakota.*
*Educators partnered with local businesses (Ace Hardware, Hy-Vee) in workshop presentations.*

**Results**
Food Preservation: Extension is the direct link to the consumer with accurate information for home food preservation:
*Participants identified several food preservation techniques that had a direct effect on safety and quality:*
  * Acidification of tomatoes to reduce the risk of Clostridium botulinum growth:*
    * Pressure canners must be vented for 10 minutes maintain the proper amount of pressure.*
    * Importance of processing times of various food items.*
    * Reducing product failure and maintaining safety with proper jar closure techniques.*
    * No longer recommended to can low-acid foods in a boiling-water-bath canner.*
    * One participant said: "I will change my method of canning so my food products given as gifts will be safe."
* Function of different forms of pectin.*
*451 food preservation calls were answered by family and consumer sciences Extension educators and state staff.*
*1,192 food preservation timetables and fact sheets were distributed.*
*167 Pressure canners were tested with recommendations that 41 gauges be replaced.*
*44 news columns and 1 newsletter were written addressing food preservation and food safety issues, reaching a potential of over 62,500 readers.*

Farmers Market:
*58 people participated in the "Local Foods: Food Safety and Marketing" self-study course. 75% successfully completed the program. Identifies the risks associated with food production that is direct-marketed primarily through farmers markets. Delivered online and via CD-ROM.*
*After completing "Local Foods: Food Safety and Marketing," all participants expressed a strong appreciation for an online self-study course. Participants identified the following as particularly useful topics:*
  * Using proper produce-washing techniques and cleaning and sanitizing produce containers.*
  * Fertilization and irrigation techniques.*
*Knowledge was gained regarding the risks associated with adding value to a product by using food preservation techniques.*

Hand Washing: According to the CDC, the single most important thing we can do to keep from getting sick and spreading illness to others is to clean our hands. Failure to wash, or insufficiently washing hands, contributes to almost 50% of all food-borne illness outbreaks.
Data collected from Food Safety/Fight BAC SOFY camp of 55 youth indicates the importance of knowledge gained:
  * 85% learned to wash hands often.*
  * 91% know how to safely thaw meat.*
  * 86% learned when meat is fully cooked and how to use thermometers.*
  * 75% learned about the 2-hour rule.*
  * 82% learned to use separate cutting boards for meat and vegetables.*
81% learned to use coolers when transporting food.
*1,705 youth received hand-washing instructional materials, a demonstration, and actual hand-washing sessions on proper hand-washing procedures. 50 hand-washing posters were distributed.
*Over 7,500 youth and adults received information on the importance of hand hygiene and personal hygiene practices around farm animals through posters and distribution of pamphlets and hand sanitizers at venues where farm animals are exhibited (i.e., Black Hills Livestock Show).

4. Associated Knowledge Areas

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<td>New and Improved Non-Food Products and Processes</td>
</tr>
</tbody>
</table>

Outcome #3

1. Outcome Measures

Number of producers/processors/end users that have developed and are delivering a product impacts the economic/quality of life for the people of South Dakota.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1</td>
<td>14</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**
Adding value to a food product through a processing or preparation process requires working through a regulatory process and gaining knowledge on the risks and safe food handling practices that must be implemented to reduce the risk of foodborne illness or other related foodborne safety issues, such as food allergies.

**What has been done**
Each year, up to 15 specialty food processors/preparers utilized SDSU testing labs. SDSU Extension Food Safety Specialists has become a food processing authority for acidified foods. Extension Educators provide a direct contact in the field to link to expertise on the SDSU campus.

**Results**
Food entrepreneurs utilize the information provided to guide them through the process of meeting the regulation requirements through the state of SD and the FDA. This is a growing need. And future programs are being developed.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
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<tr>
<td>511</td>
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</tr>
</tbody>
</table>
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 (fuel prices)

**Brief Explanation**

The cost of raw product used in the development of new food and other products, and the cost of labor, is a major determinant in the overall viability of a product. In addition, rising food costs impact consumer decisions regarding the purchase of a new product, versus the purchase of an existing/known product.

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

1. Evaluation Studies Planned
   - Before-After (before and after program)
   - During (during program)
   - Case Study

**Evaluation Results**

**Key Items of Evaluation**