V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program
Diabetes Education

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>
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<tbody>
<tr>
<td>724</td>
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<td></td>
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V(C). Planned Program (Inputs)

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

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<thead>
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<th>Year: 2009</th>
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<tr>
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<tr>
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<tr>
<td>Actual</td>
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

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<td>1472553</td>
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V(D). Planned Program (Activity)

1. Brief description of the Activity
Diabetes is a growing problem worldwide, nationally and in Texas. The number of Americans with diabetes (21 million) is projected to increase 43 percent by 2020. Health-care costs now average $11,744 per diabetic person costing the United States $174 billion. $116 billion (70 percent) is spent on health care and (30 percent) in lost productivity. Just over 4 percent of the population has diagnosed diabetes, but almost $1 of every $5 spent on health care is for people with diabetes. Currently, only 7 percent of people with diabetes are at recommended levels for blood glucose, blood pressure, and blood cholesterol. Annual cost of diabetes to Texas is estimated at $12.5 billion. In Texas 2.1 million people have diabetes, with only 1.7 million people from 18 years old and older (9.7 percent of this age group) aware that they have the disease. Of those diagnosed with diabetes, Caucasian, non-Hispanic comprise 8.3% of this population; Black, non-Hispanic, 13%; and Hispanic, 11.1%. Poor nutrition and self-care management increases health care costs. People with diabetes who maintain their blood glucose, blood pressure, and cholesterol numbers within recommended ranges can keep their costs, health risks, quality of life, and productivity very close to those without the disease.

Extension’s response to this growing health problem is conducting diabetes education programs. The Do Well, Be Well with Diabetes (DWBW) program covers the basic nutrition/self-care management topics. People with diabetes can learn skills needed to control their blood glucose and prevent the onset of complications. Another program is the practical application of the first diabetes series entitled Cooking Well with Diabetes (CWWD). In the first phase of DWBW taught in 5 sessions, an overview, 4
nutrition- and 4 self-care management topics help people with diabetes learn the skills needed to manage their disease successfully. Those completing the first phase of DWBW are invited to participate in the practical application of concepts learned presented in a 4-lesson diabetes cooking school series. Both phases include pre-, post- and post-post-surveys that both contain matched blood glucose monitoring questions collected online. A third phase program entitled Do Well, Be Well con Diabetes is being developed to target the under-served Hispanic population. Five videotaped novelas—each with a lesson, handouts, flash cards of typical border foods with more or less carbohydrates–have been developed and are in process of pilot testing.

Research has focused on increasing consumption of whole grains in school lunch programs and in development and evaluation of programs to assist Women, Infant and Children programs at the State and National level to reduce obesity in participants.

2. Brief description of the target audience

The target audience is all people with type 2 diabetes who need training to learn self-care management skills such as limiting carbohydrate intake, increasing physical activity, taking prescribed medications, checking their blood glucose levels, and regularly visiting their health care providers. In 2009, in Do Well, Be Well with Diabetes (DWBW) nutrition and self-care lessons, the audience was an average age of 62 with 68 percent female and 32 percent male with 1,554 registered for classes; 1,007 (65%) completed the 5-week series; 6-Month Follow Up was discontinued replacing by telephone survey to a small participant sample. This diverse group was made up of: 168 (11 percent) were African American; 242 (16 percent) were Hispanic/Latino; 27 (2 percent) were Native American; 1,079 (70 percent) were Caucasian; and 15 were classified as other. In 2009, those graduates of DWBW participated in Cooking Well with Diabetes (CWWD): 706 registration, 526 wrap-up and 257 reunion. The average age was 62 years of age, with 563 females (79.7 percent) and 143 males (20.3 percent).This diverse group was made up of 49 (7 percent) were African American; 132(19 percent) were Hispanic/Latino;24(3.5 percent) were Native American; 471(68.5 percent) were Caucasian; and 6 (.8 percent) were classified as other.

V(E). Planned Program (Outputs)

1. Standard output measures

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<tr>
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<th>Direct Contacts Adults</th>
<th>Indirect Contacts Adults</th>
<th>Direct Contacts Youth</th>
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</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

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<tr>
<td>Actual</td>
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of group educational sessions conducted.
<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
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</tr>
</thead>
<tbody>
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<td>1314</td>
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### V(G). State Defined Outcomes

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

<table>
<thead>
<tr>
<th>O. No.</th>
<th>OUTCOME NAME</th>
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<tbody>
<tr>
<td>1</td>
<td># of participants who report improved before meals blood glucose levels after attending 4 of the 5 Do Well, Be Well with Diabetes and 3 of 4 Cooking Well with Diabetes classes.</td>
</tr>
<tr>
<td>2</td>
<td># of individuals who complete the first diabetes series of 5 lessons.</td>
</tr>
<tr>
<td>3</td>
<td>Number of nurses trained on diabetes education.</td>
</tr>
</tbody>
</table>
Outcome Measures

# of participants who report improved before meals blood glucose levels after attending 4 of the 5 Do Well, Be Well with Diabetes and 3 of 4 Cooking Well with Diabetes classes.

Associated Institution Types

- 1862 Extension

Outcome Type:

Change in Action Outcome Measure

Quantitative Outcome

<table>
<thead>
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<tbody>
<tr>
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<td>1125</td>
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Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Poor diabetes management leads to increased health care costs. People with diabetes who maintain their blood glucose, blood pressure, and cholesterol numbers within recommended ranges can keep their costs, health risks, quality of life, and productivity very close to those without the disease. Currently, however, only 7 percent of people with diabetes are at the recommended levels.

What has been done
Extension health professionals developed low-cost, pilot-tested, 9-nutrition/self care lessons taught in five sessions to 1,554 reporting. Next came the 4-lesson cooking school taught by trained Extension professionals and their health coalition members to 706 reporting. The primary goal of this Online data collection surveys for both programs provide averages for each question (demographics, blood glucose levels, knowledge questions, lifestyle changes). Diabetes blood glucose control keeps their costs, health risks, quality of life, and productivity very close to those without the disease. This grassroots diabetes educational program is to improve blood glucose management via managing their meal plan/self care to keep normal blood glucose estimated with $80 M total costs economic impact for rest of lives. The average age of participants from each diabetes educational program is about 63.5 years of age. Otherwise, if younger, the savings in estimated total costs economic impact for the rest of their lives might have been greater.

Results
Initially, diabetic persons' self-reported blood glucose was 135 mg/dL decreasing to 122 mg/dL after 6 months. * At the beginning of Do Well, Be Well with Diabetes classes, the average blood glucose before meals self-reported by participants (766 reporting) was 135 mg/dL, decreasing to 122 mg/dL at 5 weeks (635), and those in Cooking Well with Diabetes self-reported 130 mg/dL by 359 at the beginning of the series and 128 reporting their blood sugar was 115 mg/dL after the classes.

515 (33 percent) reported checking their blood glucose 2 hours after meals.

62 percent (970) of the participants reported having had a hemoglobin A1c during the 12 months prior to the beginning of classes and at the end of classes it was reported to be 7.54 for 357 participants.

At the last Cooking Well with Diabetes Class, the average hemoglobin A1c was self-reported at 6.97.

Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
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</thead>
<tbody>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
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Outcome #2

1. Outcome Measures

   # of individuals who complete the first diabetes series of 5 lessons.

2. Associated Institution Types

   ● 1862 Extension

3a. Outcome Type:

   Change in Condition Outcome Measure

3b. Quantitative Outcome

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<th>Year</th>
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</thead>
<tbody>
<tr>
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<td>993</td>
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</table>

3c. Qualitative Outcome or Impact Statement

   Issue (Who cares and Why)
   What does problem centered education really mean to the participants of both the Do Well, Be Well with Diabetes (DWBW) and Cooking Well with Diabetes (CWWD). These were obtained from the online survey data that was entered into the database by each county in which these programs were held.

   What has been done
   After participation in DWBW (1554) and CWWD (706), diabetic individuals wrote on their evaluation surveys unsolicited comments about what both the five classes, nine nutrition/self care lessons and the 4 diabetes cooking school lessons meant by helping them make some significant changes that they told about.

   Results
   Do Well, Be Well and Cooking Well with Diabetes Unsolicited Comments about their Success Stories are as follows:
   * "...My husband and I have both lost weight, reduced our A1c, and improved our lipids. Working on portions, reducing carbohydrates, and moving more is a direct result of the classes we have attended. We thank you for the support, knowledge, and experience of the leaders of the classes of both Do Well, Be Well and Cooking Well with Diabetes."
   * "...the doctors and pharmacist gave me so much information that I have gotten my diabetes and my sugar level under control..."
   * "EVERYTHING I know about diabetes came from these classes!!"
   * "...I enjoyed each class and learned so much. I am in control of my diabetes. I have it, but it doesn't have me."
   * "Demonstrations and tasting inspired me to get back into the kitchen and cook from scratch. My husband was happy about that too. Also it saves money to cook at home and it is healthier eating too."
   * "My blood sugar level is consistently decreasing as I use the things I have learned."
   * "Until I came last week I was in denial, and I didn't want to deal with diabetes because I didn't want to have it. After that meeting, I went to the doctor, had my A1c checked and got a meal plan. I feel so much better about it now. I know what to do, and I can do it."
   * "These classes have helped me know how to communicate with my doctor. He's working for me now instead of the other way around."
   * "What I learned about carbohydrate counting has been most helpful. It makes me read labels and makes portion control much easier. I also continue to exercise regularly..."
   * "I haven't really taken my diabetes serious enough; however, attending these classes makes me realize the seriousness of managing my diabetes."
   * "These have been the best classes. I've learned more in the classes than I have in 15 years since being diagnosed."
"You saved my life. I did not want to live because of this diagnosis. I made it through Thanksgiving with an excellent blood glucose reading and expect to do the same at Christmas. Thank you, thank you, thank you for saving me - physically and mentally."

"Paying more attention and reading food labels has helped me learn how to reduce salt, sugar, and fat without changing the flavor."

"Cooking and eating for diabetes is so much easier than I thought it could be. Now I am able to keep my blood glucose in control and have lost weight at the same time."

"I have learned to change recipes to reduce the fat and sugar, and to cut back on things that aren't good for you."

"Now I understand how to use the plate method, that people need to reduce the amount of starchy vegetables and how to better control my blood glucose."

"Since beginning classes 8 weeks ago, I have lost 20 pounds."

"Sharing the cooking tips, being with other people with the same problem as me and learning more about diabetes."

Another diabetic woman reported that she is cooking differently for her family: adding more fiber, recognizing foods with more starch that affect her blood glucose, controlling portion sizes, using more herbs and spices instead of salt, using cooking methods without added fat, and has learned to substitute non-caloric sweeteners for sugars in her recipes.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
</table>

Outcome #3

1. Outcome Measures

Number of nurses trained on diabetes education.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
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<tr>
<th>Year</th>
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Wesley nurses who work in the under-served areas near and on the border of Texas cooperate with the county Extension agents-Family and Consumer Sciences in Texas serving on their health coalitions. That data is counted within the Do Well, Be Well with Diabetes and Cooking Well with Diabetes Summaries. However, for those Wesley nurses who do not work in counties with agents in county programs but see persons with diabetes on a one-to-one basis in their offices, they report separately into the online data survey collection.

What has been done

The Wesley nurses have been trained by the health and nutrition specialists in face-to-face training in 2007. They have opportunities in an online training made available for their use to keep them updated on the diabetes program and any changes made to it.

Results

The online data summary for an additional 50 persons they assisted with Do Well, Be Well with Diabetes began the series with 46 finishing it. The ages they reached were 4 to 5 years older than our average 62 year old
females. They helped the participants decrease their fasting blood glucose from 108 mg/dL before breakfast to 99.8 mg/dL.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
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<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>724</td>
<td>Healthy Lifestyle</td>
</tr>
</tbody>
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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.)

Brief Explanation

External factors which could affect outcomes in diabetes education in Texas could be lack of access to some health care professionals in rural areas such as dietitians, nurses or other health care professionals who are current in diabetes nutrition and self-care management. Since both the Do Well, Be Well with Diabetes and Cooking Well with Diabetes programs use the model of health coalitions to support the diabetes programming statewide, this could affect the diabetes programming effort.

Appropriations being cut could limit the amount and quality of diabetes educational programming that can be planned, implemented and evaluated in each county. Also, the Extension State and County professionals are interacting with other State agencies such State Department of Health Services--Texas Diabetes Council and private funders such as the United Way, American Diabetes Association, Texas Beef Council, Dairy Maxx and diabetes companies who provide both funding (TX Diabetes Council) and in-kind types of resources as well.

Competing public priorities and programmatic challenges may be a factor in clientele deciding to participate in diabetes programs over other community programs. Diabetes research is conducted by the Center for Obesity Research and Program Evaluation and targets foods and food ingredients which contribute to a reduced risk of obesity and obesity linked diseases such as diabetes. In addition, diabetes research related to human nutrition is conducted by both the Departments of Nutrition and Food Science and Animal Science.

Costs of gasoline and time away from other responsibilities could also be a factor in whether or not a client selects to participate these diabetes lessons. Also, funding for the delivery of these lessons--although low costing for the most part--might be limited. Costs to cover the food preparation in Cooking Well lessons might also be a factor which might need to be covered in a small registration fee.

Texas is projected to have a greater incidence rate and increased costs in the future due to the growing population of Hispanics/Latinos, who are at a greater risk for the disease. The burdens of diabetes mismanagement are disproportionately borne by those with little or no insurance coverage, lower literacy, poor or no English skills, lower educational and income levels, and poor access to transportation. Diabetes research on targeting under served audiences beginning with Hispanic programming has been planned and developed by a task force and is now being pilot tested in two South Texas Border counties.

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

1. Evaluation Studies Planned
Before-After (before and after program)

Evaluation Results

“Do Well, Be Well with Diabetes” DWWD Useable Survey Data collected online: 1,554 registration; 1,007 Wrap-Up. In "Cooking Well with Diabetes" CWWD Useable Survey Data collected online: 706 registration; 526 Wrap-Up Summary; 257 Reunion Surveys. Some 427 health professional volunteers who would cost roughly $60/hour (5 week (2 hours/5 lessons DWBW=10 hours; 4-weeks (1.5 hours/4 week CWWD=6 hours per volunteer). Therefore, $60 costs/volunteer X 16 hours=$960 X 427 volunteers=$409,920 saved via health volunteers assisted with both DWBW programs.

Summary Economic Impact for DWBW phases 1 & 2: The potential lifetime health care cost savings from improved diabetes management by 2009 participants, is an estimated $80 million for rest of their lives. Goal for both DWBW and CWWD is to keep blood glucose levels below 126 mg/dL.

Key Items of Evaluation

Interpretation of the program results for “Do Well, Be Well with Diabetes" DWBW (phase 1) and "Cooking Well with Diabetes" CWWD (phase 2) resulted:

DWBW Pre-/post-survey results were as follows: DWBW, average age was 62 with 68% female and 32% male with 1,554 registered for classes; 1,007 (65%) completed the 5-week series; 6-Month Follow Up was replaced by telephone survey to a small participant sample. Only 34% (531) had previous diabetes classes with 66% stating they had no previous classes; Some 36% (561) had diabetes for 5 years or more and 28% (428) had diabetes less than a year with those in between at 2 to 4 years with diabetes 27% (478). When asked about type of meal plan given by dietitian or doctor, 45% (692) answered no meal plan; 17% (265), carbohydrate counting; 4% (62), diabetic exchange lists; 4% (63), plate method; with other, and eating regular meals with no sugar or concentrated sweets for rest of those responding. Some 766 participants reported seeing average before meals blood glucose values of 135 mg/dL (1st class) to 122 mg/dL at 5 weeks. In last 7 days, 67% (1044) checked blood sugar before breakfast with average fasting blood sugar at 99 mg/dL reported (recommended fasting blood glucose at 70 mg/dL to <126 mg/dL or under 100 mg/dL); 2 hours after meal 33% (515) checked their blood glucose with average reading of 117 mg/dL (recommended after 2 hours is 120 mg/dL or less); 1 hour after meals, 140 mg/dL or less); 62% (970) had A1C test in last 12 months with only 38% (597) with average 12 at the beginning of classes with 35% (357) reducing to 7.54 on wrap-up survey.

2009 CWWD surveys were completed by enrolled diabetic individuals: 706 registration, 526 wrap-up and 257 reunion. The average age was 62 years of age, with 563 females (79.7 percent) and 143 males (20.3 percent). This diverse group was made up of 49 (7 percent) were African American; 132(19 percent) were Hispanic/Latino;24(3.5 percent) were Native American; 471(68.5 percent) were Caucasian; and 6 (.8 percent) were classified as other. Some 89.6 percent of respondents had never previously participated in a cooking school. The average hemoglobin A1c was reported at 6.97. When asked about the type of meal plan they followed on the 706 registration surveys, participants answered as follows: diabetes food exchanges, 9.8 percent (61); carbohydrate counting, 17.3 percent (108); plate method, 4.0 percent (25); 6.9 percent (43) other meal plans; and 48.7 percent (303) receiving no meal plan at all. The 2009 wrap-up evaluations (526) revealed that 90.2 percent (442) could recognize starchy vegetables; at least 91 percent (469) knew how to make foods taste sweeter by adding vanilla; and 94 percent (489) knew which cooking method would not reduce the fat content of the food. Many other food preparation techniques were learned during the Cooking Well lessons.

Data analysis for CWWD has been completed by Program Development specialist and results will be documented in peer-reviewed abstracts and/or publications in 2010.