

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

**Program # 5**

**1. Name of the Planned Program**

Childhood Obesity

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components		50%		20%
703	Nutrition Education and Behavior		50%		80%
	<b>Total</b>		100%		100%

**V(C). Planned Program (Inputs)**

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	1.7
<b>Actual Paid</b>	0.0	0.0	0.0	2.7
<b>Actual Volunteer</b>	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	4454	0	175823
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	146006
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

Probiotics have been linked to health benefits to include improvement of lactose digestion, enhancing the immune system, synthesizing and enhancing the bioavailability of nutrients, and reducing risk of certain cancers. Approximately 60-80% of African Americans are lactose intolerant. Lactose intolerance is the clinical condition caused by the inability to digest lactose in milk and dairy products. The more consumers become aware of the health benefits of yogurt containing probiotics, the more they will demand them. Still, the presence of a probiotic in yogurt does not guarantee its effectiveness; survival of a probiotic in yogurt during shelf-life as well the fact that it can be delivered to the site of the gastrointestinal where it exerts its effects are crucial to its health benefits. *Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp *bulgaricus* and other lactobacilli with lactase activity in yogurt will be evaluated for their efficacy: 1/ their enumeration in samples of yogurt to document concentration of probiotics at different times during the shelf-life when stored at 4 degree celsius; 2/ the testing of their ability to survive in the stomach by exposing cells of probiotics to simulated gastric juice at pH 3.0 and 2.0 and recovering viable cells in MRS agar; and 3/ the testing of their ability to survive in the bile salts by detection of bile salt hydrolase (BSH) enzyme activity in MRS agar supplemented with 0.5% taurodeoxycholic acid. Yogurts with effective probiotics will be used in a human study to demonstrate that increase consumption of yogurts can relieve lactose symptoms, increase calcium intake, and reduce weight gain in lactose intolerant African Americans college students (18-20 years old).

Nutrition education program will be developed where students diagnosed as lactose intolerant will be educated to increase their consumption of dairy products to 3 servings per day. Courses related to dietary guidelines, Foods and dairy products composition in calcium, vitamin D, and lactose; low-lactose foods; and strategies to increase dairy products will be taught. Group and individual approaches will be applied. Pre and post data will be collected to include dairy products intake, calcium and vitamin D intakes, weight, and symptoms of lactose intolerance.

Currently more than 25-29% of Arkansans 18 years of age and older are obese (Centers for Disease Control and Prevention (CDC) 2007a). Less than 28% of Arkansans participated in "No Leisure-Time Physical Activity", which is slightly above the national average of 24.1%. A qualitative and quantitative design was used to explore original data on the dietary and physical activity patterns common to African-American students in the Lower Mississippi Delta (LMD) to develop an educational program, "Eating to Live," that will empower college/university aged students with knowledge and skills to evaluate their current diet and physical activities. Students were taught how to modify food choices at individual meals to meet the Dietary Guidelines for Americans, 2005 (DG) and encouraged to increase physical activity (PA), with the long-term goal of lifetime weight maintenance.

## 2. Brief description of the target audience

UAPB students who are diagnosed or self-diagnosed as lactose intolerants and, therefore, are avoiding consumption of dairy products. The majority of participants will be African Americans and aged from 18 to 25 years old; there will be males as well as females. A Junior student in Nutrition and Dietetics in the department of Human Sciences, Para Nosakhere, assisted in the literature review and recruitment of participants. Results of survey on education sessions to increase consumption of dairy products reported to participants at UAPB and the campus of UAPB (through UAPB Faculty and Students Research Forum 2013), and the 1890 Community through the ARD Research Forum (Jacksonville, FL, 2013). Education of African American adults on the health benefits of yogurts containing probiotics through an acceptability study and education sessions based on increasing knowledge about the importance of consuming dairy products and using strategies to allow for consumption of lactose containing dairy food with minimal or no symptoms for this group. Also, smaller portions of dairy foods regulated consumption of lactose-free milk, as well as low-lactose yogurt (with probiotics) and cheese (cheddar, Swiss, Mozzarella) Consumption of

enzyme preparations to lower lactose content are emphasized.

This projects 3 objectives: 1/ the selection of yogurts containing effective probiotics to reduce symptoms of lactose intolerance through quantitative and qualitative microbiological tests from 2008 to 2010; 2/ Feeding study of African Americans adults (18-20 years old) to examine the health benefits of selected yogurts in reducing lactose intolerance symptoms, increasing calcium intake, and reducing weight gain in 2010-2012; 3/ Education of African American adults on the health benefits of yogurts containing probiotics in 2012-2013.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	15	120	130	0

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	0	1	0

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

**Output Target**

**Output #1**

**Output Measure**

- 1. Education sessions

<b>Year</b>	<b>Actual</b>
2014	1

**Output #2**

**Output Measure**

- 2. Increase dairy products consumption

<b>Year</b>	<b>Actual</b>
2014	10

**Output #3**

**Output Measure**

- 3. Increase calcium intake

<b>Year</b>	<b>Actual</b>
2014	10

**Output #4**

**Output Measure**

- 4. Increase vitamin D intake

<b>Year</b>	<b>Actual</b>
2014	10

**Output #5**

**Output Measure**

- 5. Weight gain  
Not reporting on this Output for this Annual Report

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

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

O. No.	OUTCOME NAME
1	1. Number of participants in the education program
2	2. Increase dairy products consumption
3	3. Increase calcium intake
4	4. Increase vitamin D intake
5	5. Weight gain

**Outcome #1**

**1. Outcome Measures**

- 1. Number of participants in the education program

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	15

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

**Issue (Who cares and Why)**

Individuals with lactose intolerance symptoms avoid dairy products resulting in reduced intake of calcium and vitamin D. Deficiencies of these two nutrients may predispose individuals to bone mineral deficiency, osteoporosis, and maybe obesity.

**What has been done**

Fifteen African American students enrolled at UAPB and who are lactose intolerant participated in two, one hour education, sessions on the benefits of consuming dairy products.

**Results**

Results showed an increase from 0.7 cup to 1.85 cup of dairy products per person and per day. The average daily intake of calcium increased from approximately 500mg to 800mg. There was an increase in vitamin D intake from 1.3 µg per to 2.5 µg.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

## **Outcome #2**

### **1. Outcome Measures**

2. Increase dairy products consumption

### **2. Associated Institution Types**

- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	10

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

#### **Issue (Who cares and Why)**

Individuals who want to experience improvement to health, lactose digestion, improved immune system and want to reduce the risk of certain cancers.

#### **What has been done**

The results have been disseminated at the 2014 Rural Life Conference to approximately 80 poster viewers. Fifteen African American students enrolled at UAPB and who are lactose intolerant participated in two, one hour education, sessions on the benefits of consuming dairy products.

#### **Results**

Results showed an increase from 0.7 cup to 1.85 cup of dairy products per person and per day.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

### **Outcome #3**

#### **1. Outcome Measures**

3. Increase calcium intake

#### **2. Associated Institution Types**

- 1890 Research

#### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

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

##### **Issue (Who cares and Why)**

Individuals interested in growing new bone and maintaining bone strength and preventing osteoporosis/ osteopenia.

Research shows evidence that calcium can help prevent or control high blood pressure and reduce PMS symptoms as well as play a role in preventing certain cancers. Calcium may also aid in weight loss.

##### **What has been done**

The results have been disseminated at the 2014 Rural Life Conference to approximately 80 poster viewers. Fifteen African American students enrolled at UAPB and who are lactose intolerant participated in two, one hour education, sessions on the benefits of consuming dairy products.

##### **Results**

Results showed an increase of 300mg of calcium intake per day (an increase of 52%) and an increase of dairy intake from 0.7 cup to 1.85 cups per person and per day.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

## **Outcome #4**

### **1. Outcome Measures**

- 4. Increase vitamin D intake

### **2. Associated Institution Types**

- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	10

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

#### **Issue (Who cares and Why)**

Individuals who are vitamin D deficient (approximately 50%). Vitamin D intake is important for the regulation of calcium and phosphorus absorption, maintenance of healthy bones and teeth, and is also recommended to supply a protective effect against multiple diseases and conditions such as cancer, type 1 diabetes and multiple sclerosis.

#### **What has been done**

The results have been disseminated at the 2014 Rural Life Conference to approximately 80 poster viewers. Fifteen African American students enrolled at UAPB and who are lactose intolerant participated in two, one hour education, sessions on the benefits of consuming dairy products.

#### **Results**

The intake of vitamin D increased from 1.3 µg per to 2.5 µg per day.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

## **Outcome #5**

### **1. Outcome Measures**

5. Weight gain

### **2. Associated Institution Types**

- 1890 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	130

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

#### **Issue (Who cares and Why)**

Youth in African-American communities and their relatives who have a goal of preventing obesity in late adolescents and young adults.

#### **What has been done**

The "Eating to Live" program's was initiated as part of the Delta Obesity Project to investigate the effectiveness at long-term weight maintenance. Weight loss and weight maintenance was evaluated in an 18-month intervention, consisting of a 6-month education phase and a 12-month maintenance phase, using 130 student, aged 18-24 years, with a BMI of 18.5 to 29 who were recruited from the University of Arkansas at Pine Bluff.

#### **Results**

More than 130 students were reached through the obesity project. African-American students (age 18-24 years) participated in the "Eating to Live" intervention which encouraged weight maintenance using intervention strategies including adapted dietary and physical activity patterns together. Adoption of the Dietary Guidelines and participation in the "Eat to Live" program education goals were substantially met.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Other (limitations; students dropout )

#### **Brief Explanation**

Ten out of fifteen participants submitted their pre and post 24-hour recalls. This was a lower than expected response rate.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Results showed an increase of 1.2 cups of dairy products consumption per person and per day (from 0.7 cup to 1.85 cups, an increase of 62% from pre-intervention). There was an increase of 300 mg of calcium intake per day and per person from 500 mg to 800 mg (increase of 52%) and an increase of 1.2 micrograms of Vitamin D per day and per person (from 1.3 micrograms to 2.5 micrograms). It will be interesting to take anthropometric and weight data in the future to see how weight is affected by calcium and vitamin D intake.

#### **Key Items of Evaluation**

Short nutrition education intervention on the benefits of increasing dairy products consumption in lactose intolerant can have an effect in increasing dairy products consumption and thus, calcium and vitamin D intakes in African American college students.

lactose intolerant  
college student  
dairy product consumption  
calcium intake  
vitamin D intake