

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

**Program # 4**

**1. Name of the Planned Program**

Health and Nutrition

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
501	New and Improved Food Processing Technologies	0%		20%	
701	Nutrient Composition of Food	0%		20%	
703	Nutrition Education and Behavior	100%		25%	
704	Nutrition and Hunger in the Population	0%		15%	
721	Insects and Other Pests Affecting Humans	0%		5%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		5%	
724	Healthy Lifestyle	0%		10%	
	<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>	9.5	0.0	38.5	0.0
<b>Actual Paid</b>	25.6	0.0	41.4	0.0
<b>Actual Volunteer</b>	2.1	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
303419	0	467133	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1595836	0	2226523	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4971912	0	4754365	0

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

### 1. Brief description of the Activity

**MAES.** The research reported under this program covers all aspects of research efforts to improve the health of Minnesota children, and their families. This includes research on understanding the health benefits of various foods in our diet, as well as, work being done in collaboration with industries to improve the flavor, and consumer acceptability of more nutritious options. Several studies are exploring health and nutrition from the point of view of underserved populations in Minnesota including seniors, ethnic, and low-income groups.

Research highlights for 2014 include:

- A study on snack consumption among midlife women explored how the attitudes and motivations surrounding food impact healthy eating and dieting. In the study, normal weight women tried fewer weight maintenance strategies, had higher self-efficacy scores, and were also more likely to have more positive attitudes toward food. The study highlights the need for healthcare professionals to consider motivation, and attitudes, regarding food when advising midlife women on weight issues.
  - Researchers studying the effect of heat on various oils discovered that increased heat, length of heat application, and the level of unsaturation in the oil was tied to increased formation of toxic substances.
  - Researchers conducted a randomized, controlled-intervention to test nine behavioral economic strategies parents can use in the home to increase their children's vegetable intake. Results are being analyzed.
  - Researchers working to develop rapid and sensitive methods for detection of SBAs in the environment were able to construct 3-D microfabricated scaffolds for bone tissue engineering.
  - Food scientists were able to block the bitter compound catechin via Maillard chemistry, and thermal processing.
  - Flavor specialists improved the flavor quality of UHT milk by using natural products from olive oil waste streams to suppress off-flavor pathways.
  - Novel bitter compounds in whey protein in Cheddar cheese were identified, and reported, to play a role in the flavor perception of aged Cheddar flavor.
  - Researchers discovered that some gastric bypass patients taking vitamin D supplements post-surgery experienced small improvements in their vitamin D status while others remained vitamin D deficient. Further research is needed to ascertain if these results can lead to a broader discovery on vitamin D as it relates to obesity.
- A study on milk- and soy derived proteins effect on blood pressure found no impact on blood pressure at the levels tested. Researchers also concluded a new delivery method for bioactive peptides is needed

to continue such research (incorporating them into cookies was unpalatable for the study participants).

- Researchers found Eicosapentaenoic acid (EAP) enhances fatty acid storage, and energy dissipation capacity in subcutaneous adipocytes, contributing in part to EAP's metabolic benefits.
- Building on previous work related to children's acceptance of whole grain alternatives when partnered with foods they already like, researchers identified Chinese chain restaurants as an ideal opportunity to introduce brown rice as a substitute for white rice. Consumption statistics suggest the availability of brown rice in Chinese restaurants would lead to increased patronage among brown rice eaters.
- A new whole-wheat pre-cooked alkaline noodle designed for the Asian market tested well for overall quality and taste compared to traditional pre-cooked noodles. The product is designed to satisfy customer's needs for a tasty and quick choice, with their desire for a healthier alternative.
- A study on children's snacking habits found snack choices are dominated by foods high in added sugar and energy. Nutritionists suggest substituting low sugar, whole milk yogurt paired with fruit or vegetables at snack times to increase consumption of valuable nutrients like vitamin D, calcium, and potassium which are traditionally underrepresented in children's diets.

**Extension:** To ensure program excellence and resilience as federal funding becomes less secure, Extension restructured its Health and Nutrition programs in FY2014. Minnesota SNAP-Ed funding, in particular, was on a downward trend due to the new formula for state allocations from the Healthy, Hunger-free Kids Act (December 2010). When extreme temporary funding cuts were sustained in FY2013, staffing levels were maintained for one full year before the restructure, tapping non-federal funds and cost-saving measures.

The restructure included an initial 40% reduction in staff, with plans for some level of restaffing. EFNEP was reduced in the Minneapolis-St. Paul metropolitan area with a third of the previous numbers of paraprofessionals at the outset. Eventually, there will be 3/4 of the previous number of paraprofessionals. SNAP-Ed moved to a regional model from its previous county-based approach. Initially, staff was reduced to a quarter of the previous number of field staff. Eventually, there will be approximately half the previous number of field staff. SNAP-Ed staff moved from an exclusive focus on direct and indirect education to a full range of complementary public health approaches at the organizational and community level, which also impacts direct contacts.

Extension, however, continued to monitor the impact of nutrition education programming on consumption of foods like low fat dairy and calcium, whole grains, fruits and vegetables, as well as positive changes in food shopping and preparation and physical activity. Programs proved to make a difference in the consumption of fruits, vegetables, low fat calcium, and whole grains among youth, teens, and adults.

An evaluation of a comprehensive school-based program called Go Wild with Fruits and Vegetables revealed a variety of results. (See Evaluation Results.) The evaluation was extremely valuable in increasing understanding of the benefits and limitations of an intervention like this one.

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

- Children, parents, and other adults from low-income families.
- Professionals who work with low-income families.
- Members of Minnesota's ethnic minority groups who bring a history of food and nutrition based on culture and lifestyle.
  - School personnel seeking assistance in implementing federal regulations and improving healthy food choices of children.
  - Increasingly, community organizations, policy makers, and public institutions.

**MAES** research target audiences also include:



2014

2009

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

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

O. No.	OUTCOME NAME
1	Program participants will increase human nutrition knowledge. (Target expressed as percentage of participants who report knowledge change.)
2	Program participants will increase their skills in selecting and buying food that satisfies nutritional needs, managing food budgets and preparing affordable foods within the food groups. (Target expressed as percentage of participants who reported learning those skills.)
3	An increased number of program participants will use research-based information from Extension to improve their intake of healthful foods and engagement in physical activity. (Target expressed as a percentage of participants who self-report change.)
4	Research will support families, children and youth access to healthy foods. (Measure: Number of active research projects on families' ability to access healthy and affordable foods.)
5	Research will provide the technology and knowledge to improve food to increase healthy foods' desirability and consumption.

### **Outcome #1**

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

Program participants will increase human nutrition knowledge. (Target expressed as percentage of participants who report knowledge change.)

Not Reporting on this Outcome Measure

### **Outcome #2**

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

Program participants will increase their skills in selecting and buying food that satisfies nutritional needs, managing food budgets and preparing affordable foods within the food groups. (Target expressed as percentage of participants who reported learning those skills.)

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	92

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

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

People with limited resources often run short on food at the end of the month. Some may not realize they can make healthier choices at the store that will affect how they eat at home. The choices and habits that children experience at home are known to affect eating habits throughout a lifetime, ultimately impacting health and well-being. Knowledge of what constitutes a healthy food choice is translated into behavior at the store and, ultimately, at home.

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

Nutrition education classes taught teens and adults about shopping and cooking at home. Previous evaluations have shown that education should be reinforced over time and with multiple workshops, with learning and hands-on experiences, in order to change behavior. We measured the effects of six or more classes on managing food budgets and preparing affordable foods within food groups. The knowledge ultimately affected behavior change.

##### **Results**

Ninety-six percent of adults and 87 percent of teens increased their knowledge of ways to shop for and prepare food (average = 92 percent). Moreover, this knowledge related to some behavior change: 30 percent of teens and 38 percent of adults reported changing their shopping and food preparation habits after learning about healthy options.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

#### Outcome #3

##### 1. Outcome Measures

An increased number of program participants will use research-based information from Extension to improve their intake of healthful foods and engagement in physical activity. (Target expressed as a percentage of participants who self-report change.)

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	40

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

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

Home budgets, as well as life experiences, have prevented some families preparing food that can improve their health and well-being. Being exposed to the importance of healthy eating to avoid conditions like obesity and diabetes can prevent the ultimate negative outcomes of these illnesses.

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

Nutrition education and SNAP-Ed programs promote and deliver community education to promote healthy nutrition choices. Longer-term education in community settings is emphasized in order to move people beyond knowledge change and into behavior change.

###### **Results**

Among those individuals who attended a minimum of six hours of classes, 40.33 percent improved their intake of healthful foods and engagement in physical activity. Adults showed the

greatest change in eating vegetables and fruits. In addition, 49 percent increased their consumption of low fat dairy and calcium, 37 percent increased their physical activity, and 28 percent increased consumption of whole grains. To a lesser extent, teens increased their consumption of fruits and vegetables, and 41 percent increased consumption of low fat dairy; 36 percent increased consumption of whole grains, and 28 percent increased their physical activity. Finally, youth significantly increased their consumption of fruits and vegetables.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

#### Outcome #4

##### 1. Outcome Measures

Research will support families, children and youth access to healthy foods. (Measure: Number of active research projects on families' ability to access healthy and affordable foods.)

Not Reporting on this Outcome Measure

#### Outcome #5

##### 1. Outcome Measures

Research will provide the technology and knowledge to improve food to increase healthy foods' desirability and consumption.

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	0

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

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

According to the CDC, Americans eat twice as much salt as recommended. While the health risks associated with high sodium intake are widely known, many Americans won't sacrifice taste to eat healthy.

### **What has been done**

Food scientists at the Flavor and Research Education Center are exploring how we can produce great and "salty" tasting products, with less sodium. Their research shows the first bite is significant as only 10-20 percent of the total sodium in food is released in the mouth. This means that 80 percent of sodium in food is wasted flavor-wise by being eaten, but not tasted. With this knowledge, they developed a test to show how the sodium in bread dissolves in your mouth. From this data, researchers are finding ways to slow down the release of salt -- such as adjusting the interaction between salt and protein (which can cause salt to stick to food), thus allowing for an earlier release.

### **Results**

Researchers believe they can formulate processed foods to have up to 40 percent less salt content without impacting the flavor in any way. This technology and knowledge will allow food producers to use significantly less sodium while keeping customers happy and away from the salt shaker.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

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

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

- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges

### **Brief Explanation**

As noted in the introduction, health and nutrition programs were reshaped in 2013 and 2014 in order to ensure program excellence and resilience in the face of less secure federal funding. As a result, the number of adults served by Extension for health and nutrition programs decreased by 48 percent from 2013 to 2014, and the number of youth served directly decreased by 62 percent. In our plan of work for future years, we will describe program interventions focused more on community, organization, and policy outcomes that will stimulate more healthful choices at the family level.

**MAES.** Given the economic downturn in the grain-based industry researchers working to incorporate more whole grains in children's diets had difficulty funding plate waste studies. Additionally, challenges discovered within the food system in the delivery grain-based foods to schools and restaurants led us to not report an outcome regarding youth access to healthier food choices in 2014.

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

### Evaluation Results

During the 2012-2013 school year, 397 students at 22 elementary schools throughout Minnesota participated in seven Go Wild with Fruits and Vegetables classes taught by Extension's SNAP-Ed Educators. An evaluation that concluded in 2014 used a protocol including group randomization into a treatment group, and a group with delayed treatment used as a control group. As part of the evaluation, students wore pedometers and answered survey questions about fruit and vegetable intake, physical activity and healthy habits. Parents also answered surveys about their children. During this evaluation we used various tools to measure BMI, physical activity, quality of life, and fruit and vegetable intake. There were four key findings:

- 1) **The program increased the propensity of youth to try new foods.** Parents raved about how their child was much more willing and excited to try new foods. Of all respondents, 48 percent reported that their child is more willing to try new foods. When children are excited to try new foods, they are more likely to find healthy foods they like. Parents explained that the school program reinforced discussions about healthy eating already happening at home, allowing for positive social influence. Parents also appreciated this new willingness, because it is less financially "risky" to buy foods that children had eaten and liked at school.
- 2) **Parents reported that their child's participation in the nutrition education program had healthy effects on other members of the family.** As children create healthy household habits such as food preparation, these habits are likely to become long term. Of respondents, 32 percent indicated that the program had influenced more people than just the child in the program, indicating that other family members were trying healthy foods.
- 3) **Based on the Day in a Life questionnaire completed by students, there was an increase in fruit intake between October 2012 and 2013.** About a year following, the students maintained this habit of eating more fruits.
- 4) **However, there was an overall decrease in vegetable intake during the program, and vegetable consumption decreased in the year following.** This general pattern of increasing fruit intake to a greater degree than vegetable intake is consistent with other published research. Vegetable intake across the board is hard to influence. As a result, Extension will look at emphasizing the importance of vegetable intake during nutrition classes.

### Key Items of Evaluation

An examination of a school-based nutrition education program found very positive results in causing children to try new foods. Moreover, the child's participation in the program had a positive effect on fruit intake during and after the intervention. However, vegetable intake decreased before and after the program. While many components of the program should be successfully replicated, designers will pay attention to more focused attention on vegetables.