V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food, Nutrition, and Health

☑ 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
305	Animal Physiological Processes	0%	0%	10%	0%
501	New and Improved Food Processing Technologies	3%	0%	10%	20%
502	New and Improved Food Products	5%	0%	10%	15%
604	Marketing and Distribution Practices	5%	0%	0%	0%
701	Nutrient Composition of Food	0%	15%	0%	10%
702	Requirements and Function of Nutrients and Other Food Components	5%	15%	10%	15%
703	Nutrition Education and Behavior	40%	50%	0%	0%
704	Nutrition and Hunger in the Population	0%	20%	0%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%	0%	15%	40%
721	Insects and Other Pests Affecting Humans	2%	0%	20%	0%
723	Hazards to Human Health and Safety	10%	0%	20%	0%
724	Healthy Lifestyle	30%	0%	5%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	13.5	1.0	14.9	2.0
Actual Paid Professional	15.8	3.3	22.5	3.0
Actual Volunteer	2869.0	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**
1226257	354779	367363	530089
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1284172	258617	967458	605445
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
3119310	224862	4993978	81027

V(D). Planned Program (Activity)

1. Brief description of the Activity

Food, nutrition, and health - Conducted educational classes, workshops, meetings, and trainings, developed products, curriculum, resources, facilitated coalitions and/or task forces, conducted assessments and community surveys, partnered with community agencies and institutions to facilitate programs and community development, create/revise social systems and public policies, conducted research studies, disseminated programs and research results through papers, reports, and media, developed and implemented marketing strategies using various outlets to promote program participation, disseminated research-based information to consumers using a variety of media and technology resources, cooperated with media and other community agencies to seek effective means of reaching new and non-traditional audiences, and respond to consumer inquiries.

Vector-borne diseases and public health pests - Conducted research to further our understanding of vector-borne diseases caused by insects and pests, and disseminated science-based results to stakeholders through workshops, trainings, etc.

2. Brief description of the target audience

Food, nutrition, and health - Young adults (ages 18 to 59), older adults (age 60 and older), caregivers of older adults, adults with type 2 diabetes, parents and caregivers of individuals with type 2 diabetes, senior center and meal site staff and volunteers, and Extension educators.

Vector-borne diseases and public health pests - Researchers, public health agencies, schools, institutions, Extension educators

Retail and food service employees, retail and food service management, temporary food vendors, child care providers, young adults (ages 25-59), older adults (ages 60 and older), Extension educators, **other researchers, policy makers** and commercial food processors.

Childhood Obesity: young children (ages 2 - 5 years); school-age children; adolescents; parents, foster parents, and grandparents; caregivers (in-home and for-profit day care providers); teachers and other school faculty for young children, youth, and adolescents; school nutrition directors and staff; school wellness committees; school nurses and other health care providers; and Extension educators.

The Family Nutrition Program (FNP) provides educational programs on food security to limited resource families, primarily youth and mothers with young children.

3. How was eXtension used?

Content by specialists has been uploaded into eXtension. Additionally, agents and specialists are listed as experts for the "Ask an Expert" link. Therefore agents and specialists have answered questions that have come through eXtension from Virginia. eXtension was also used to help people network with others working in the area of local foods and food security.

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	167303	60251	0	0

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

Patent Applications Submitted

Year: 2013

Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	163	17	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of adults participating in diabetes educational programs.

Year	Actual
2013	315

Output #2

Output Measure

- Number of adults participating in at least one session on adult nutrition, fitness, worksite wellness, or health.
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of research papers published on adult obesity and related chronic disease.

Year	Actual
2013	36

Output #4

Output Measure

- Number of Master Food volunteers trained to extend the work of an Extension educator.

Year	Actual
2013	127

Output #5

Output Measure

- Number of research papers published on vector-borne diseases and public health pests.
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of workshops/trainings conducted on preventing and treating vector-borne diseases and public health pests.
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of youth participating in food, nutrition and health programming.

Year	Actual
2013	94408

Output #8

Output Measure

- Number of direct contacts with youth and adults through the Family Nutrition Program

Year	Actual
2013	129000

Output #9

Output Measure

- Number of small businesses or producers assisted through the Business Innovation Center

Year	Actual
2013	44

Output #10

Output Measure

- Number of consumers completing home food preservation training offered by extension educators in Virginia

Year	Actual
2013	1138

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase in the number of individuals with diabetes who have improved their Hemoglobin A1c level, meal planning behaviors or physical activity behaviors, three months after participating in a Diabetes Education programs offered in collaboration with a local health care provider.
2	Increase in number of adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.
3	Number of discoveries from completed obesity related research projects which focus on examining adult obesity from its root causes to its association with chronic disease.
4	Number of discoveries from completed research projects which focus on vector-borne diseases and public health pests.
5	Identification of Bioactive components to prevent and treat Diabetes and Vascular disease
6	Gene editing in disease vector mosquitoes
7	Wildlife Matters in Food Safety
8	Childhood Obesity
9	Safe Home Food Preservation
10	Family Nutrition Program
11	Specialty Foods

Outcome #1

1. Outcome Measures

Increase in the number of individuals with diabetes who have improved their Hemoglobin A1c level, meal planning behaviors or physical activity behaviors, three months after participating in a Diabetes Education programs offered in collaboration with a local health care provider.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Nearly 500,000 Virginians have been diagnosed with diabetes and another 250,000 have diabetes and don?t know it. Diabetes is the 6th leading cause of death in Virginia and adds to deaths from heart disease and stroke.

Diabetes complications exert a high cost in money, loss of productivity, and quality of life. In Virginia diabetes leads to 11,700 hospitalizations each year adding nearly $173 million to our health care bill. Kidney failure with required dialysis treatment, an outcome of uncontrolled blood glucose levels, carries an annual cost of at least $72,000 annually per patient. The burden of diabetes is disproportionate to African Americans, Hispanics, the elderly, those with limited income, and the medically underserved

What has been done
Extension agents have partnered with the VT Center for Public Health Practice and Research, the VT Dept of Psychology, and other health professionals to offer Balanced Living with Diabetes (BLD). BLD, funded by the National Institutes of Health, provides practical education to help people with type 2 diabetes and their families learn about self-care, food choices to control carbohydrate intake, and life style patterns that prevent or slow the complications of their disease. BLD includes 4 weekly classes and a reunion class 3 months following, with further reassessment at 6 and 12 months. Programs target African Americans and the underserved, and are offered in cooperation with black churches. Eleven class series were offered in 2013 in Danville, Bristol, Marion, Caroline, and Essex. Program outcomes are evaluated according to improvement in eating patterns, diabetes care, increase in physical activity (steps walked per week), and

hemoglobin A1c levels, a measure of average blood glucose levels over the 2 to 3 months prior.

Results

In 2013 315 Virginians participated in BLD; 96% were African American and 76% female. By preliminary calculations nearly 1/3 of participants had incomes below $10,000 and over half were below $30,000. Following a meal planning method to control carbohydrate intake is a cornerstone of BLD and on reassessment, most participants reported using a meal planning method at least 4 to 5 days or more each week. For those whose health permitted increased walking, use of step-counters included with class handouts encouraged increases in physical activity and likely contributed to the modest yet consistent weight loss observed in various participants. Hemoglobin A1c, measuring diabetes management, fell on average 0.5% to 0.7% among those whose baseline A1c was 7.0% or above (the American Diabetes Association recommends an A1c below 7.0%). The Journal of the American Medical Association reported people who decreased their A1c by even 0.5% required fewer physician visits in the years following and could save at least $685 per year in health care costs. Changes within individuals demonstrated drops in A1c from 10.1% to 6.5% and 12.8% to 8.6%. A decrease in A1c of 1.0% lowers the risk of diabetes complications such as blindness or renal failure by 40%. BLD provides a practical meal pattern consistent with cultural and ethnic preferences that is suitable for the entire family and can contribute to a healthy weight and diabetes prevention among children and younger family members.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Increase in number of adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of discoveries from completed obesity related research projects which focus on examining adult obesity from its root causes to its association with chronic disease.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of discoveries from completed research projects which focus on vector-borne diseases and public health pests.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Identification of Bioactive components to prevent and treat Diabetes and Vascular disease

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Cardiovascular disease (CVD) is No.1 killer of the American people. There are about 26 million or over 8% of people as of 2011 who suffer from diabetes in the US and this number is expected to double by 2025. Efforts are therefore required on many fronts to address these major public health problems. Among these, a search for novel agents that prevent and treat diabetes and vascular disease, is extremely important to decrease the burden of morbidity from these chronic diseases, and thus promote the health of the American people. The Virginia Tech College of Agriculture and Life Sciences has identified food, nutrition, and health as a key program initiative.

What has been done
Research in my lab is focused on identifying and characterizing phytochemicals from food sources or medicinal herbs that provide beneficial effects on diabetes and/or CVD. To that end, we have screened over 100 compounds using both in vivo and in vitro systems established in my lab. We have identified several compounds that may provide beneficial effects on diabetes and/or diabetic vascular complication. Further, we are investigating the underlying mechanism whereby these molecules exert a potential beneficial effect on these human chronic diseases. In the second area, we are investigating how flavonoids exert anti-diabetic and anti-inflammation effects. We found that several flavonoid compounds can improve the function of beta-cells where

insulin is synthesized. We then discovered the molecular targets for these compounds in the islets. We further found that these compounds can prevent diabetes in animal models for human diabetes. Additional, we are presently creating a biological system to screen over 4,000 natural compounds present in foods and various medicinal plants to identify potential anti-diabetic effects.

Results
These studies allow us to develop novel approach using natural and low-cost compounds to decrease the morbidity related to vascular diseases and diabetes. A conditional patent application for one of our discovery has been filed by Virginia Tech Intellectual Property Office. In addition, the demonstration of the health benefits of food components in these chronic diseases is also expected to have a significant effect on the U.S. agriculture. This would expect to further stimulate medical interest in functional foods, and increase the human consumption and the utilization of the dietary supplements derived from agricultural products.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components

Outcome #6

1. Outcome Measures

Gene editing in disease vector mosquitoes

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Vector-borne diseases such as dengue fever and malaria are increasing, with severe epidemics occurring worldwide. As of December, 2013, an outbreak of chikungunya virus in the Carribean continued to grow, marking the first such outbreak in the New World. Vaccinations, chemotherapeutics, insecticides, source reduction and education have not yet been sufficient to control these severe public health crises. While additional progress in all these areas must be made, it is vital to develop any technologies that can supplement the tools we already possess.

Gene editing strategies aimed at manipulating the genome of the disease vector offer the potential to support these efforts.

What has been done
In this project, we aimed to develop, streamline and standardize new technologies to edit the genome of the most important vector of arthropod-borne viruses, the yellow fever mosquito Aedes aegypti.

Results
Using novel gene editing tools, we have generating site-specific genomic deletions that phenocopy a known visible mutant in the yellow fever mosquito, Aedes aegypti. Our initial publication appeared in PLoS One in March 2013. In just 9 months, the paper has been viewed more than 4,300 times, with more than 800 PDF downloads and five citations, including Nature Methods. This work was also picked up by both the popular and scientific press, being featured by nbcnews.com (http://www.nbcnews.com/science/disease-fighters-disrupt-mosquitos-genes-molecular-scissors-1C9007366) and Biotechniques (http://www.biotechniques.com/news/TALENs-Show-a-Talent-for-Altering-Mosquito-Genome/biotechniques-341610.html). The methods we have developed have the potential to revolutionize both basic research aimed at understanding mosquito-virus interactions as well as applied work to generate mosquito populations unable to transmit arboviruses such as those

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans

Outcome #7

1. Outcome Measures

Wildlife Matters in Food Safety

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Contaminated fresh tomatoes have caused several multistate Salmonella outbreaks in recent years, yet the source of contamination is still unclear.

What has been done
To investigate this issue, VSU's Food Safety Research Program recently collaborated with Virginia Department of Health to evaluate wildlife as potential vehicles of outbreak causing Salmonella. VSU scientists tested hundreds of wildlife specimens from deer, geese, ducks, gulls and turtles and isolated a variety of Salmonella strains, some of which have been historically linked to outbreaks from tomato consumption. Birds were responsible for a large number of Salmonella-positive samples in this study.

Results
The results of this study suggest that wildlife such as gulls are potential vehicles for foodborne pathogen contamination at produce farms. Thus, effective control measures (e.g. fruit washing and cold storage) for post-harvest, processing, and food service operations should be utilized in conjunction with good agricultural practices to prevent future outbreaks. The research team has successfully published the conclusions in Applied & Environmental Microbiology and Zoonoses & Public Health.
To minimize the impact of environmental contamination observed in the tomato production, VSU scientists also teamed up with industry experts to evaluate fruit sanitization and cold-chain treatments. Findings from these pathogen intervention studies have been cited recently by industry magazines (FreshCuts, The Packers, etc.) and university extension articles (University of Florida, University of Maryland, etc.) to reach the food industry and consumers nationwide.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Childhood Obesity

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	94408

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Childhood obesity is a major public health concern with numerous short- and long-term health and psychological consequences. It is estimated that 32% of US children and adolescents were overweight or obese in 2011-12. Although these levels seem to be leveling off, continued educational efforts are needed to support lifelong healthy eating patterns and physical activity.

What has been done

In 2003, a small study was conducted with Virginia Cooperative Extension Educators to assess the attitudes, practices, and needs of Educators toward addressing childhood obesity. At the time of the study, there were no Extension curricula in place on childhood obesity in Virginia or nationally. Written questionnaires were administered to 40 educators. Nearly 80% considered childhood obesity a "growing problem;" however, only 12 indicated they had taught classes on childhood obesity and nearly one-third were considering it. The biggest perceived barrier was lack of resources and information. The findings demonstrated the need for curricula and a stage-based training on childhood obesity for Extension. As a result, the Healthy Weights for Healthy Kids program was developed for children between the ages of 7 and 14, utilizing the Experiential Learning Model and incorporating dimensions of the social-ecological model. Key behavioral factors within the curricula were chosen based on a comprehensive review of existing scientific literature and recommendations from several national organizations, such as USDA and CDC, including overall healthy eating, sensible portion sizes, choosing healthy snacks, limiting sugar-sweetened beverages, increasing physical activity, and decreasing sedentary behavior. (Over the years, the program has been updated to be consistent with new dietary recommendations and icons, such as MyPyramid and now MyPlate.) To address concerns that weight-centric messages might elicit disordered eating, a lesson was also created on body image and diversity, in order for children to recognize that each child has a unique and healthy weight. Each activity was aligned to the English, Math, and Science Virginia Standards of Learning since kids perform better when they have a healthy diet and are physically active. The program is designed to provide uniform messages to children, but the activities and experiences can be tailored to meet the specific needs of the youth being served. The program utilizes a train-the-trainer model. Each year, Agents and Educators from 4-H, Family and Consumer Science (FCS), and the Family Nutrition Program, consisting of EFNEP and SNAP-Ed, areas are trained on the program and on childhood obesity, so that they have the skills to deliver the program to youth in their communities. In many situations, 4-H and FCS Agents then train school staff to offer the program within schools.

Results

Last year marked the 10th year anniversary of Healthy Weights for Healthy Kids. Since its creation, over 200,000 youth have participated in Healthy Weights for Healthy Kids through Virginia Cooperative Extension efforts, with 95% of youth representing low-income populations served by the Family Nutrition Program alone. The program is offered at school, after school, at summer camps, as part of 4-H clubs, and at various other locations. Extension Agents and Educators like the program because it is ?easy to use, and has both structure and flexibility. Children like it because it is considered ?learner-centered? meaning that they learn by doing and experiencing the activity, like measuring the amount of sugar in soft drinks. And it works. Based on data from 300 fourth and fifth grade students, youth reported that they ate more nutritious foods, drank more water and milk, drank less soda, and moved more. Combined with a parent education component, children's weight status also improved as a result of participating in the Healthy Weights for Healthy Kids program. Healthy Weights for Healthy kids was listed as a ?best practice? within the Society for Nutrition Education?s Division of Nutrition Education for Children in 2006, won the National Extension Association for Family and Consumer Sciences Award for

Excellence in Research in 2007, and was recently identified as a program with ?preliminary evidence of replicability? by the National 4-H Council. The Healthy Weights for Healthy Kids program has proved to be a time-tested and effective program for Extension Agents and Educators and children.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #9

1. Outcome Measures

Safe Home Food Preservation

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1138

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The number of consumers preserving foods at home continues to increase, as more consumers emphasize greater control over what they eat and where their food comes from. Failure to adequately preserve foods in the home can result in foodborne illness. Foodborne botulism is a severe form of food poisoning. Most of these cases are associated with improperly processed home-canned food. Just one case of botulism can cost $1,343,592 related to medical services, deaths, lost work, and disability. In order to prevent illness, it is essential that consumers follow validated recipes when preserving foods at home. Historically Extension educators have been recognized as a credible resource for home food preservers.

What has been done
To help ensure safe home food preservation methods Virginia Cooperative Extension agent(s) provided food preservation trainings and support across the state in 2013. 25 extension agents provided home food preservation support in over 54 counties.
Education offered across the state included:

?30 General canning classes presenting beginner canning information including (but not limited to) differences between high and low acid foods and how to select the best preservation methods for each food.
?61 high acid (jams, jellies, pickles, fruits, etc..) canning classes demonstrating hands on canning using a boiling water bath canner
?36 low acid (vegetables, meats, fish, etc?) canning classes demonstrating hands on canning using a pressure canner
?255 dial gauge inspections for accuracy.
?520 one-on-one individualized home preservers support via phone/e-mail

Results
Home food preservers completing education through VCE programs were evaluated to determine their knowledge gain in safe home food preservation techniques and how the training impacted their future behaviors.
1138 participants increased their knowledge in the following areas
?477 learned how to can low acid foods using a pressure canner
?752 learned how to can high acid foods using a boiling water bath canner
?863 learned the importance of pH in determining the acidity of foods
?386 learned how to make jams/jellies and other fruit spreads
?310 learned how to make pickles, relishes and other fermented vegetables
?385 learned how to dehydrate foods
?406 learned how to freeze foods
757 participants intended to change the following behaviors as a result of the training:
?406 can low acid foods using a pressure canner
?569 use safe food preservation techniques
?33 freeze more foods
?436 dehydrate more foods
If a gauge is determined to be inaccurate after testing, the Extension Educator recommends replacement of the gauge and re-testing of the new gauge to ensure accuracy. Of those tested, 91 were inaccurate and recommended for replacement. It is assumed that if one case of botulism can be prevented through replacement of an inaccurate dial gauge, the potential annual savings to the State of Virginia (or County(ies)) can be $122 Million dollars.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Family Nutrition Program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	129000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
American youth, ages two through nineteen, are overweight and obese. Childhood obesity is a disease which can lead to premature high blood pressure, cholesterol, and diabetes. Minority youth suffer disproportionately from health issues related to being overweight and obese. Obesity impacts the quality of life of our children and increases the likelihood in obesity into adulthood.

What has been done
In an effort to curtail the increase of health issues related to overweight and obesity within our limited-income youth, the Family Nutrition Program, Supplemental Nutrition Assistance Program-Education (SNAP-Ed), teaches nutrition education to the target population in a myriad of venues. A minimum of six comprehensive programs are taught to children from ages three to nineteen using age appropriate curricula. Classes are taught using an experiential design and address these topics: increase in fruits and vegetables; increase consumption of low-fat dairy products; using whole grains most of the time; eating low-fat protein foods and beans; incorporating exercise into their daily lives; and preparing nutrient-dense foods. These topics are the foundation of a healthy diet and are important for weight management.

Results
129,000 4-H youth enrolled in the six or more hour nutrition programs resulting in behavior change. Of this number, 48,214 completed evaluations showing the following results:
Grades 3-5
Pre: Never & Sometimes Post: Most Days & Everyday
Eating vegetables 36% 76%
Eating Fruits 23% 96%
Eating healthy snacks 50% 93%
Eating breakfast 20% 96%
Being physically active 34% 98%
Washing hands pre meals 20% 98%
Grades 6-8
Pre: None to 1time/day Post: 2-4 Times/Day
Eating vegetables 69% 94%
Eating fruits 41% 6%
Drinking milk 91% 43%
Eating whole grains 53% 75%

Pre: 2-4Times/Day Post: None - 1 Time/day

Drinking soda 69% 70%
Pre: 0-2 Days/week Post: 3-7 Days/week
Being Physically active 33% 86%
Pre:3-5 Hrs/Day Post: <1-2 Hrs/day
72% 59%

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #11

1. Outcome Measures

Specialty Foods

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	44

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The production of value-added agricultural products continues to be a growth area in the food industry, providing opportunities to people interested in developing businesses and to farmers looking for alternative ways to utilize and market their crops. Start-up companies need direct assistance in complying with increased federal and state food safety regulations, and to transfer knowledge in food manufacturing. Business and marketing training is also necessary to increase success.

What has been done
44 businesses received assistance from Food Safety Extension Agents in cooperation with the Food Innovations Program. Assistance included 10 people seeking general information before business start-up, 11 businesses seeking assistance in locating processing facilities, and 23 companies needing more in- depth personalized assistance including guidance on nutritional

analysis, shelf-life extension, process validation, regulatory compliance, and product development.

Results
Regulatory assistance helped three businesses remain open. All three businesses were cited by regulatory officials and told that without compliance, warehoused product would be in jeopardy and further manufacturing would need to cease. Two of these companies were family businesses where all or part of their income was generated by the company. The other mid-sized company was cited by FDA and told to cease production of three products important to the company portfolio. The company reports 10 employees with revenue between $1-5 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Family and Consumer Sciences agents continue to be lower in number than agents in 4-H Youth Development and ANR thereby reducing the number of participants they are able to reach. FCS programs have begun to engage volunteers therefore extending their outreach. 4-H Youth Development Agents as well as ANR agents have increased their delivery of programs related to food, nutrition of health, also extending the reach of VCE in these focus areas.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The Virginia Cooperative Extension's EFNEP enrolled 22,864 low income youth and 958 low income adults whose incomes were equal to or less than 185% of Federal poverty guidelines. Through an eight nutrition lesson series, participants learned to select, buy, prepare, and store foods to meet the nutritional needs of their families, while operating within sound budget and gaining organizational skills. Pre and post program measures reported that participating adults in EFNEP changed: 93% showed improvement in food resource management practices; 95% showed improvement in one or more nutrition practices; 78% demonstrated acceptable food safety practices at completion of the program. Youth participating in EFNEP reported: 81% improved their ability to choose foods according to Federal Dietary Recommendations; 85% of Grades 3-5 improved in one or more core areas; 95% of Grades 6-8 improved in one or more core areas; and, 91% of

Grades 9-12 improved in one or more core areas. 1121 Volunteers contributed 5.08 FTEs to EFNEP.

Chronic diseases are the leading cause of morbidity and mortality in the United States. A sedentary lifestyle and a poor diet are linked to being overweight and obese and increases chances of developing chronic diseases like heart disease, stroke, cancer, and diabetes. Fortunately, these same diseases respond best to positive changes in health behaviors. The CDC reports, of deaths occurring in Virginia during 2005, 25% were linked to heart disease and 24% were associated with cancer. A reported 1,642 Virginians died from diabetes in 2005. Chronic diseases result from unhealthy lifestyles and have become a financial burden to the state and federal government. The estimated medical cost associated with obesity is $147 billion annually. Likewise, an obese person has annual medical costs that are $1,429 more than his or her normal weight counterpart. EFNEP and SNAP-Ed teaches families, youth, and seniors skills necessary to promote healthy lifestyles, eat more meals at home, prepare healthy and tasty meals for their families, increase fruit and vegetable consumption, control portion sizes, move more every day, move more and watch less television, and replace sugary beverages with healthy options. Participants completing the EFNEP and SNAP-Ed series of six lessons improved nutrition and food behavior.

Post-lesson data gathered through behavior change questionnaires in EFNEP have shown:

82% used food labels more often to make food choices

80% of participants improved in the variety of foods in their diet

73% increased their fruit consumption

52% increased consumption of low fat milk and milk products.

In SNAP-Ed, post-test data reported:

73% used food labels more often to make food choices

66% of participants improved in the variety of foods in their diet.

62% increased their fruit consumption.

44% increased consumption of low fat milk and milk products.

The Centers for Disease Control and Prevention report 62% of adult Virginians and 17% of youth are overweight or obese and at risk of chronic disease. There is a critical need for educating consumers to improve overall health and quality of life in Virginia. Virginia Cooperative Extension (VCE) Family and Consumer Sciences (FCS) agent educators provide

expertise and training with a food nutrition and health focus. As resources continue to diminish, trained Trained volunteers can help expand program delivery by educating more participants and freeing Extension the FCS Educator educator's time to develop new audiences and programs.

The Virginia Cooperative Extension Master Food Volunteer Program (adapted from Kansas State University) incorporates an extensive 30-hour peer reviewed curriculum training, with 32 lesson plans/presentations, and supplemental teaching resources. In 2009, this program was implemented in VCE's Northern District,Virginia and continues to expand. Participants gain knowledge of how to increase their consumption of fruits/vegetables, whole grains, increase physical activity, and learn how to purchase and prepare healthy, low-cost foods. Effective teaching techniques for working with diverse audiences are also emphasized. As a result of the training, volunteers reciprocate a minimum of 30 hours annually their first year by supporting Extension Educators through education and outreach efforts. In 2013, 154 volunteers reached 16,401 adults and youth statewide, contributing 4,656 volunteer hours through demonstrations at farmers' markets, home food preservation workshops, health/wellness programs, nutrition/healthy cooking programs and physical activity programs. The time volunteered equates to an approximate value of $103,083.84 (hours*22.14/hour; independent sector estimate). Additional trainings are planned for 2014, and it is estimated 50 new volunteers will join this program.

Volunteers report that they have increased daily consumption of fruits/vegetables and are increasing daily physical activity. A volunteer joined the local Extension Leadership Council and several improved public speaking skills. In addition, some supervised the canning section of their county fair.

External funding sources in the amount of $17,930 provided program support. Some of these sources include City of Alexandria, Roanoke County Libraries, VCE Family Nutrition Program, Grow Appalachia, Floyd Health Community Action Team grant, Girls on the Run, Portsmouth General Hospital Foundation, Prince William Schools.

Seven new audiences and 6 new partnerships were established. Some of these include 4-H summer enrichment classes, Project Learning Tree, ESL Hispanic middle school students; Childcare Center training with LEAP and Organ Wise with Nutrition Outreach Instructors. New partnerships include Roanoke City Schools, Roanoke Valley Libraries, and local worksites.

The Junior Master Food Volunteer Teen Mentor Program is currently being piloted to reach more youth through VCE's 4-H youth healthy living initiatives. The Virginia Cooperative Extension Master Food Volunteer Program (adapted from Kansas State University) incorporates an extensive 30-hour peer reviewed curriculum training, with 32 lesson plans/presentations, and supplemental teaching resource In 2013, this program was implemented in Floyd County and will continue to expanded statewide in 2014 Teen mentors gain knowledge of how to increase their consumption of fruits/vegetables, whole grains, increase physical activity, and learn how to purchase and prepare healthy, low-cost foods through completing the Teen Cuisine curriculum.

In addition, teens are further trained on youth leadership skills including history of Cooperative Extension and Virginia Cooperative Extension, risk management, youth development, presentations/demonstrations, and working with diverse audiences. As a result of the training, teen mentors reciprocate a minimum of 15 hours annually their first year by supporting youth/adult partnerships through education and outreach efforts.

Teen Mentor Volunteer Support: In 2013, 5 Teen Mentors reached 42 youth, contributing 23 volunteer hours through a 4-H day camp, What's Cooking, in Floyd County. Additional volunteer trainings are planned for 2013, and it is estimated a total of 10 - 20 new teen volunteers will join the Junior Master Food Volunteer Teen Mentor program.

Teen Leadership Development: The Teen Mentors have reported that they have increased their consumption of fruits, vegetables, and grains. They also indicate that they are drinking fewer sugary drinks and have increased their level of physical activity.

During summer 2014, the teen Mentors provided leadership during a What's Cookin' Day Camp in Floyd with the 4-H Youth Development Agent and Family and Consumer Sciences Agent. During this day camp, the Teen Cuisine curriculum was featured and each teen was responsible for teaching at least one lesson plan from this curriculum.

During 2014, a Teen Mentor will be creating small books for preschoolers with activities to encourage them to eat more vegetables. In addition, all of the Teen Mentors plan to assist with an after-school series at the local library for elementary schoolchildren to focus on preparing healthy food snacks.

External Funding: External funding in the amount of $2,000 from the Svoboda Foundation and New River Community Foundation was obtained to provide volunteer training and program support.

2013 Junior Master Food Volunteer Teen Mentor Program Reaches More Youth through Family and Consumer Sciences and 4-H Youth Development Programs.

The Centers for Disease Control and Prevention report 62% of adult Virginians and 17% of youth are overweight or obese and at risk of chronic disease. The CDC also cites studies that suggest obese youth are more likely to become obese adults. Adult obesity is associated with a number of serious health conditions including heart disease, diabetes, and some cancers. There is a critical need for educating consumers to improve overall health and quality of life in Virginia. Virginia Cooperative Extension (VCE) Family and Consumer Sciences (FCS) and 4-H Youth Development agent educators provide youth volunteer and mentor training with a food, nutrition, health focus and emphasis on leadership. As resources continue to diminish, trained teen mentors can help expand program delivery by educating more youth participants and freeing the FCS and 4-H Educator' time to develop new audiences and programs.

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Key Items of Evaluation

Because of increased attention and community assement identified need, Virginia Cooperative Extension hired two agents whose job responsibilites focus entirely on food safety and food safety education. Additionally, VCE hired two regional FCS agents who focus entirely on local foods and local food systems.