

2012 University of the District of Columbia Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 05/20/2013

I. Report Overview

1. Executive Summary

The University of the District of Columbia is a relevant and active urban land-grant institution. The University's College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) houses two essential land-grant components, the Agricultural Experiment Station and the Cooperative Extension Service. CAUSES offers associate, baccalaureate, graduate, and professional degree programs in several relevant areas of academic study. More specifically, the College offers innovative academic programs in Architecture and Community Development; Environmental Science and Urban Sustainability; Health Education; Nursing; Nutrition and Dietetics. A wide range of community education programs are available through our fine Land-Grant Programs Centers to include: 1) Center for Urban Agriculture and Gardening Education; 2) Center for Sustainable Development; 3) Center for Nutrition, Diet and Health; and 4) Center for 4H and Youth Development.

In the midst of continued challenges, our research and extension programs continue to emerge to effectively serve the varied cultures and socio-economic classes of communities in our nation's capital. During the past year, under the leadership of Dean Sabine O'Hara, we have worked steadfastly to thoughtfully restructure and integrate research and extension in all of our Land Grant Centers programs to achieve a higher level of efficiency and effectiveness.

As a College, we recognize that we are connected to people and places right in our own neighborhoods and to those halfway around the world. Pollution travels, resources are not always consumed where they are generated, and job markets are increasingly global and knowledge-based. Given these realities, we aspire to learn with our students and communities to work in diverse teams, and to focus on systems connections and innovation. We apply these principles to all of our programs, professional development certificates, and community outreach and youth programs. Our vision is to become a world leader in designing and implementing top quality, research and community outreach programs that measurably improve the quality of life and economic prosperity of people and communities in the District of Columbia, the nation, and the world.

This plan reflects our accomplishments and the results of our research and extension efforts via our programs in support of the residents of the District of Columbia. The joint report includes six program areas critical to the District of Columbia and residents nationwide. Our program areas include: Climate Change; Global Food Security and Hunger; Health, Nutrition and Childhood Obesity Prevention; Urban Families, Youth and Communities; and Sustainable Energy.

We have established a Merit Review Process for the Agricultural Experiment Station that continues to work well at ensuring that research proposals are judged fairly and on their merit. For Hatch and Mini-grants offered through the Station, the process includes: the development of a RFP; Solicitation of RFP; Receipt of Proposals; Review of Proposal Packets for Completion of Requirements; Peer Review; Director's Review; Completion of Required Forms for submission to USDA; Electronic Submission to USDA for expert panel review; USDA Approval; and Issuance of Award. The Peer Review panel includes representatives from various departments/schools across the University. An external panel from USDA,

2012 University of the District of Columbia Combined Research and Extension Annual Report of Accomplishments and Results as well as other colleges and universities, and experts are used as necessary.

The Peer Review Committee assesses our program's proposed research projects and activities based on the following criteria:

- Knowledge base of the research
- Adequacy of procedures and experiment to meet the objectives
- Feasibility of accomplishing the objectives
- Scientific merit of the proposed research
- Familiarity with work of others related to the proposal
- Outcomes and Impacts
- Appropriate budget for proposed research
- Budget Justification

All research projects are monitored by the Director and Associate Director to ensure that objectives and timelines are being met. An annual progress report is required and is reviewed by the Station Director prior to electronic submission to USDA. All research projects must include student learning experiences. Research findings are published in refereed journals, posters are developed and presented at conferences, and fact sheets or Information Documents are prepared and distributed to stakeholders. Students participate in conference presentations as well as research seminars.

The Agricultural Experiment Station continues its work with institutions across our nation to resolve issues related to obesity and nutrition. Our multi-state research projects include: "Changing the Health Trajectory of Older Adults through Effective Diet and Activity Modifications" and "An Integrated Approach to Prevention of Obesity in High Risk Families." Other relevant research conducted by the Station includes health (diabetes, breast cancer), sustainable energy, sustainable agriculture, urban gardening, and specialty crops.

The Cooperative Extension Service continues to be instrumental in its outreach efforts across the eight wards of the city. Appropriate attention has been given to the underrepresented and underserved populations of the District of Columbia. 13,182 workshops (22% increase from 2011) and 579 demonstrations (10.7% increase from 2011) were conducted at various sites throughout the city. Our interactions with DC youth, families, and communities increased by 68.8%, as we provided direct service to 316,819 compared to 188,143 in 2011.

Stakeholder Listening Sessions were held in underserved wards, 7 and 8, in the District of Columbia. Thoughtful focus was placed on these wards as they are populated by the most economically depressed residents of the city. Essential to our connection to city residents in these wards is the strong foundation of the faith-based community. Through dialogue at Community Listening Sessions, partnerships have been established, which have resulted in our increased visibility and service to the residents of those communities. Residents report that they are concerned about employment, health issues, healthy foods, nutrition, food safety, childhood obesity and hunger, and the environment.

Research and extension activities for each planned program follow.

1. **Climate Change**

The University has undergone a mandated rightsizing effort which affected units across the University of the District of Columbia. As a result, The Water Education Program agent's position was abolished. As part of the restructuring of land-grant programs, an Assistant to the Dean for Academic Programs and Climate Initiatives was established. The position has been filled by a well qualified incumbent who will now work to support Climate Change initiatives in the land-grant programs. Through

RPFs we will continue to solicit faculty with appropriate expertise to conduct research in this critical area. We continue to provide workshops, demonstrations, and literature in support of this program area through our urban forestry initiatives with the Center for Urban Agriculture and Gardening Education.

We continue our focus on invasive, non-native plant species as they are a problem of increasing concern in the District of Columbia. The presence of invasive species have become ubiquitous on both private and public land. They successfully compete with native and non invasive plant species for space, sunlight, water and nutrients. If left unchecked, they upset the ecological balance by crowding out desirable and native vegetation, creating monocultures, and reducing biodiversity through habitat degradation and hybridization, the ramifications of which reverberate through the food chain. Unchecked populations have effectively taken over public right-of-ways, large sections of National and District parkland, and privately owned land. Yet invasive, exotic weeds not only remain uncontrolled, but are still being introduced into the landscape because the public is largely unaware of the overall concept of invasive species, let alone what these species are, and the extent of damage they cause ecologically and economically. Thus, we are using outreach as the first line of defense. We deem it invaluable for early detection and rapid response.

2. Global Food Security and Hunger

According to a report by Feeding America, the nation's leading domestic hunger relief charity, in the United States, more than one out of five children lives in a household with food insecurity, which means they do not always know where they will find their next meal. According to the United States Department of Agriculture (USDA), 16.7 million children under 18 in the United States live in this condition - unable to consistently access nutritious and adequate amounts of food necessary for a healthy life. In 2009, the top five states with the highest rate of food insecure children under 18 included the District of Columbia. 20% or more of the child population in 40 states and D.C. lived in food insecure households in 2009.

More than one in seven people in Washington D.C. reported in 2012 not having enough money to buy food that they or their family needed at some points during the prior twelve months, according to a new report released by the Food Research and Action Center. In Washington, DC over 60% of the city's 43 full service grocery stores are located in the northwestern part of the city. Parts of the city that have the least access to full service grocery stores are without access to regular public transportation and are largely populated by minorities that on average have lower incomes and higher obesity and type two diabetes rates.

District residents can improve their diets and health by raising their own vegetables. Urban gardening is a useful way to augment one's food supply, increase physical activity and engage in a low-risk, esteem-building activity that can bring communities together. Because of the many available resources in the District, little financial investment is required, and even a small garden plot can be productive under the right conditions. Therefore, the Cooperative Extension Service's Center for Urban Agriculture and Gardening Education programs set up rotating demonstration garden plots across the city to demonstrate to residents that they, too, can grow their own fresh food. Additionally, the Center supports private gardeners and community gardens by providing technical support.

Through the efforts of the Center for Urban Agriculture and Gardening Education, there were 157 gardening site visits in the city and participation from 27 community volunteers who worked on the Muirkirk Research Farm in Beltsville, Maryland. 1,155 Newsletters and 1,985 Fact Sheets were distributed. Through direct contact, we reached nearly 1,000 residents.

An outreach effort was made to introduce stakeholders (indigenous and immigrants) to the availability of ethnic and specialty crops at the Muirkirk Research Farm. This resulted in an appreciation on the part of the audience, for the convenient proximity of Muirkirk farm to the communities.

In addition, our list of vegetables made great impression as participants delighted in their accessibility and affordability. We have received positive feedback from organizations and individuals. Some examples follow:

"Hi Yao,

Thank you again for your donation of ethnic crops to The Washington Youth Garden. The 2,000 local school children who came to the garden this year for field trips were exposed to ethnic edible plants that they are not used to seeing in the grocery store. Five families from our Growing Food Growing Together program got to taste the sour leaves of the hibiscus and take home the 'hens egg' eggplant along with other fresh produce to cook at home. We also shared your hot peppers with Miriam's Kitchen, which contributed to the 700lbs of produce we donated this year. The hibiscus plant was definitely the star of the garden, impressing many visitors to the Arboretum who always wanted to know what it was. I'm sorry I don't have a picture of it! I thought I did but can't find it in our albums.

We hope to work with you again next season!

Best,
Nadia"

"Dear Yao-

I hope you are enjoying the holidays and ready for a new and successful year 2013. This Christmas day, I visited our Burundian farmers to whom you provided seedlings for eggplants and pepper. They informed me that despite the summer drought and late planting, these plants grew well and that they harvested a very good quality.

Moreover, their customers enjoyed the produce and demand was extremely higher than supply, especially for eggplants.

Since it was their first experience at the farmers market, some of the lessons learned and recommendations include:

1. Need for pre-production planning to determine when to begin the seedling and planting
2. Increase production capacity and quality
3. Marketing and sales training
4. Technical assistance, if possible.

So, I would be interested in meeting you to find ways to collaborate to make their project more successful.

Over all, they expressed their sincere gratitude for the provision of seeds and look forward to meeting you in the near future.

Thank you so much.

John B Manirakiza
United Burundian American Community Association (UBACA)"

"To the Ethnic and Specialty Crops Program at University of District of Columbia/CAUSES:

From March 2012 I have participated in the Ethnic and Specialty Crops Program as a volunteer/apprentice to enhance my education as a junior agricultural student at the University of Maryland College Park. During this time, I was able to get the practical application of the Ethnic and Specialty crops production. I gained the hands on experience by working side by side with Mr. Yao and Mr. Waggie in the several demonstration gardens throughout the city and at the Muirkirk Research Farm. To list a few of my activities:

- a) Agricultural activity planning and implementation
- b) Seedling production
- c) Crop transplanting and maintenance
- d) Crop harvesting and yield data collection
- e) Marketing strategy and knowledge of the value chain

Overall I am really satisfied and grateful to have found this opportunity to work with Mr. Afantchao and Mr. Waggie for their patience, dedication and professionalism. I hope to continue learning more as I enter my second year with the program."

Carace Torrano,

Universityof Marylandstudent
actorrano@gmail.com

The DC Master Gardener Program was started as a means of extending the horticultural and pest management expertise of University of the District of Columbia Extension to the general public. The program is designed to train volunteer horticultural educators for the University of the District of Columbia Extension- the principal outreach education unit of the University of the District of Columbia. Participants receive 50 hours of basic horticulture training and then agree to work in their communities to teach District of Columbia Residents how to cultivate garden spaces and manage landscapes sustainably using research-based information. This environmental horticulture approach reduces fertilizer and pesticide use resulting in improved soil and water quality.

During the reporting period, 271 (which includes 45 trainees) Master Gardeners and trainees provided 9,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$33.61 per hour according to www.independentsector.org with a total value of \$302,490 in savings to the District of Columbia. In addition, 13,500 direct contacts were served by the Master Gardener Coordinator/Extension Agent. Forty-five (45) Master Gardener Trainees completed 50 hours of basic horticulture training, a final exam and 50 hours of volunteer hours. Various Master Gardener projects through all eight wards have been established which include schools, parks, beautification projects, landscape design, youth gardens, local and national botanical gardens, a hospice/nursing home, and partnerships with non-profit organizations. Several new projects were initiated and here are the highlights:

- 1/3 of Master Gardeners continue their education in horticulture related field and obtain employment.
- 750 pounds of produce was donated to soup kitchens.
- 150 hours of volunteer hours educated low income residents on the rooftop vegetable garden of Bread for the City.
- 35 Raised Beds at Schools were installed, planted and maintained and used for educational purposes.
- 4,000 spring flowering bulbs were planted at Calvin Coolidge High School and Takoma Recreation Center.
- 8 composting sites were piloted in DC Public Schools covering all 8 wards of the city.
- Master Gardener plant clinics were established at the U.S. National Arboretum.

3. Health, Nutrition and Childhood Obesity Prevention

Surgeon General Regina M. Bejamin, M.D., M.B.A. states, "Americans will be more likely to change their behavior if they have a meaningful reward--something more than just reaching a certain weight or dress size. The real reward is invigorating, energizing, joyous health. It is a level of health that allows people to embrace each day and live their lives to the fullest without disease or disability."

The National Diabetes Information Clearinghouse, a service of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institute of Health, reports the following:

Diabetes is widely recognized as one of the leading causes of death and disability in the United States. In 2006, it was the seventh leading cause of death. However, diabetes is likely to be underreported as the underlying cause of death on death certificates. In 2004, among people ages 65 years or older, heart disease was noted on 68 percent of diabetes-related death certificates; stroke was noted on 16 percent of diabetes-related death certificates for the same age group.

Diabetes prevalence in the United States is likely to increase for several reasons. First, a large segment of the population is aging. Also, Hispanics/Latinos and other minority groups at increased risk make up the fastest-growing segment of the U.S. population. Finally, Americans are increasingly overweight and sedentary. According to recent estimates from the CDC, diabetes will affect one in three people born in 2000 in the United States. The CDC also projects that the prevalence of diagnosed diabetes in the United States will increase 165 percent by 2050.

Breast cancer is the most common cancer among American women. One in every eight women in the United States develops breast cancer. There are many types of breast cancer that differ in their capability of spreading (metastasizing) to other body tissues. The causes of breast cancer are not yet fully known although a number of risk factors have been identified. According to the American Cancer society:

- Over 200,000 new cases of invasive breast cancer are diagnosed each year.
- Nearly 40,000 women are expected to die of breast cancer in 2012.
- There are over 2.5 million breast cancer survivors in the United States.

Over the past 30 years, obesity rates among children and adolescents have almost tripled throughout the United States. An estimated 17% of children and adolescents aged 2-19 years are obese ((defined as BMI-for-Age ≥ 95 percentile). Childhood obesity is associated with an increased risk for developing type 2 diabetes, high blood pressure, sleep apnea, and high blood cholesterol. Children who are obese are also more likely to become obese adults, further increasing their risk for obesity related diseases, including heart disease and certain cancers.

Obesity rates have affected low-income children at a disproportionate rate. Data published from the 2009 Pediatric Nutrition Surveillance System study showed that almost one third of the 3.7 million low-income children aged two to four years old were obese or overweight. Unfortunately, the number of people living in poverty is at a record high. This trend of obesity rates in low-income children will only increase unless specific actions are taken to address these issues. Obesity rates have also disproportionately affected minority children. In 2007-2008, it was found that Hispanic boys and non-Hispanic black girls were significantly more likely to be obese than non-Hispanic white boys and non-Hispanic white girls, respectively.

Our research efforts in support of this program follow:

Cloud-based Fuzzy Data Mining for Diabetes Gene Pathway Analysis

During this period, we started to investigate the above proposed topic based on our previous years of research in diabetes gene analysis. We implemented the approach we proposed in the proposal and tested on real world dataset. Based on the experimental results, we identified problems of the original

design. We searched literature for works related to the problem identified and revised the design accordingly. This new design has been implemented and tested. The results have shown that our approach is effective. That is, we can successfully generate and select high-quality gene pathway candidates from thousands of genes quickly taking advantage of parallel computing of a cloud platform. We are drafting the manuscript to submit for publication.

Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer

Vitamin E consists of four tocopherols and four tocotrienols (alpha, beta, gamma and delta) both of which are present in various components of the human diet. Tocotrienols possess several powerful anti-cancer, cholesterol lowering, natriuretic and neuroprotective properties that are often lacking in tocopherols. Tocotrienols are well understudied as compared to tocopherols. Gamma Tocotrienols (gamma-T3) induces programmed cell death or apoptosis in a variety of cancer cell lines including breast cancer cells but not in normal cells. The molecular mechanisms involved in gamma-T3 action are not well understood. The goal of the proposal was to understand the molecular basis of the action of gamma-T3. The research concluded during the reporting period.

The project made significant progress during the course of funding. Using microarray analysis and a range of cellular and molecular techniques, we demonstrated that gamma-T3 induces endoplasmic reticulum (ER) stress and activates multiple unfolded protein response (UPR) pathways. The results were disseminated in the form of research seminar sponsored by UDC AES at UDC and poster presentations at the National and International meetings. We published our results in the Journal of Nutritional Biochemistry that ranks sixth in the journals related to Nutrition and Dietetics. We further continued our studies using Tocomin, a commercially available mixture of naturally occurring tocotrienols (T3s) and tocopherol (Ts) extracted from palm oil/palm fruits. Our studies have demonstrated that both purified gamma-tocotrienol and Tocomin induce cell death and a self-eating process known as autophagy in breast cancer cells.

A second manuscript was submitted to the PLOS one for publication demonstrating autophagic involvement of dietary tocotrienols in human breast cancer cells. The manuscript was returned for revision and we are currently performing additional experiments as suggested by reviewers. The manuscript will be submitted with revisions. In addition to the work covered in the two manuscripts, we also delineated further molecular pathways that are involved in cancer cell death and autophagy, Habib Kedir, an undergraduate student has demonstrated role of metabolic sensor AMPK in the autophagy induced by Tocotrienols. A manuscript on the role of AMPK is being prepared currently for submission.

An Integrated Approach to Prevention of Obesity in High Risk Families

In this multi-state project, researchers have been focusing on the data analysis of the obesity data. During the reporting year, we have concluded our study. Over the past six years, we explored the following areas in obesity data mining.

- Model for obesity resilience definition with fuzzy-set theory
- Clustering method for variable selection
- Mobile and cloud computing for obesity data collection

We have made presentations at various places including international conference and published in peer reviewed journal. The following reviews our outputs in detail.

We developed the following:

1. Model for obesity resilience definition

During the first annual meeting of W1005, we proposed a fuzzy-set-theory based model for obesity

resilience definition. In this model, resilience is quantified with a fuzzy membership function of a selection of variables. Professor Liang and a graduate student implemented the concept of the model into a computer program which can compute the resilience measurement given values of variables. This model will be tested on data obtained from NHANES (The National Center for Health Statistics).

2. Clustering method for variable selection

We developed a new methodology which is expected to assist the selection of variables from the overwhelming amount of variables in the NHANES data. This new approach proposes hierarchical clustering for feature reduction and was tested on Diabetes and heart disease data. The manuscript is published and presented at an international conference. (Please refer to the publication section of this report.)

3. Easy-Survey software system

This system can be used for collecting research data. It synchronizes local database and online database so that survey or other electronic records of research participants entered on individual computers can be integrated into one centralized online database.

4. MyHealth Journal software system

This software system is a journal software for personal health monitoring and control. The software can be used to record body weight, amount of exercise, water intake, medicine taken etc. A user can also customize the software according to his/her own needs by adding or deleting items on the interface. A secure online database is implemented which will help users back up their information and access it from everywhere which provides better protection of the data. This software system can be integrated with the Easy-Survey software system for collecting information for obesity and nutrition research.

5. Developed Mobile version of MyHealth Journal software system

We further developed our software system, MyHealth Journal, on mobile computing platforms, for obesity data collection: iPhone and iPad. We believe that the mobility of the software tool and thus the easy of data recording will bring a break-through to obesity research data collection and obesity management. The software development has been completed for iPad. Both the PC version and the iPad version are ready to be distributed to the community of researchers and end users.

6. Cloud-computing-based techniques for obesity data analysis

The rising cloud computing technology utilizes remote and distributed computing resources to store data on clusters in different locations and process them simultaneously. This nature makes it suitable for research data collection and analysis that across states. Under my supervision, student Soufiane Berouel developed a cloud-computing-based case-based reasoning technique and applied it for investigating associations between obesity and diabetes. A technical report is written on "Case-Based Reasoning Implementation on Hadoop and MapReduce Frameworks". We plan to further develop the prototype that we have so far and improve it with the latest developments I have made in case-based reasoning.

Advancing knowledge and technology

iPhone and iPad leverages the strengths of the current mobile computing and cloud computing technology. It will change the way that researchers collect data for obesity research and the way that people monitor their own conditions, such as obesity and diabetes. We expect that, with this system, significantly larger amount of detail data can be collected over a much longer period at very low cost, which will in turn result in significant progress of diabetes research. On the other hand, when this tool is tailored for obesity management, it will greatly increase the user's awareness of the status of their key behaviors that will affect their weight and enable them to keep track of these factors.

Changing the Health Trajectory for Older Adults through Effective Diet and Activity

During the period, a survey questionnaire was constructed, field tested, and validated in order to implement intervention strategies that will increase fruit, vegetable, and whole grain consumption in the multicultural elderly population in the District of Columbia. The survey was administered by individual cognitive interview to 127 (33 male and 94 female) senior adult residents of the District of Columbia. Subjects have been partitioned into the following groups: high and low fruit, vegetable, and whole grain consumers; high and low levels of nutritional knowledge; normal weight and obese; child caretakers for more than 8 meals a week; and diet change due to diagnosis of illness. The cognitive interview technique not only collects quantitative data regarding dietary choices and nutrients, but also provides the opportunity for interviewers to respond to subjects and provide useful qualitative nutritional information and feedback. Moreover, interviewees are encouraged to share recipes, and cultural stories related to food choices, food preparation, and eating behavior. Quantitative and qualitative data collected will enable the construction and implementation of intervention strategies. Suggested modifications of recipes and food preparation will be made in order to increase the nutritional value of meals in general, and to increase the consumption of fruits, vegetables and whole grains in particular. Increased nutritional knowledge has been an incidental byproduct of the survey process. Subjects have been encouraged to modify their diets before the diagnosis of illness.

Outreach services provided by the Cooperative Extension Service follow:

Center for Nutrition, Diet and Health

In the District of Columbia, the percentage of low-income and minority children are on the rise. It was estimated in 2008 that 13.3% of low-income children aged 2-4 years was obese. Access to cost-affordable healthy foods and safe places to participate in physical activity are not sufficient in low-income neighborhoods. Therefore, daycare or school settings are efficient locations to reach these children and implement nutrition and physical activity into the curriculum for obesity prevention.

The Center for Nutrition, Diet and Health programs and activities addresses 3 of the 5 priority areas of the National Institute of Food and Agriculture (NIFA) of the United States Department of Agriculture (USDA) as follows:

During Fiscal Year 2012 many changes took place in the Center for Nutrition, Diet and Health (CNDH). The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) annual budget was reduced from \$544,200.00 to \$308,392.00 which lead to a reduction in staff and programming to the most vulnerable population groups in the District of Columbia, young children and the elderly.

CNDH conducted 12,608 workshops/ demonstrations at 283 sites in all eight (8) Wards in the District of Columbia representing 58.5% increase in contacts when compared to the 155,568 contacts in FY' 2011. The workshops/demonstrations were as follows: 2,612 in Ward 1; 910 in Ward 2; 114 in Ward 3; 3,600 in Ward 4; 434 in Ward 5; 116 in Ward 6; 1,787 in Ward 7, and 3,035 in Ward 8. Additionally, 315 individuals completed certificate programs. A total of 266,175 contacts with the assistance of 469 extension-trained teacher volunteers and facilitators in senior programs were generated. The 266,175 contacts by Ward were as follows: 45,051 in Ward 1; 22,761 in Ward 2; 2,863 in Ward 3; 57,785 in Ward 4; 13,951 in Ward 5; 12,241 in Ward 6; 50,880 in Ward 7; and 60,643 in Ward 8.

The following programs are reported on during this reporting cycle:

Supplemental Nutrition Assistance Program- Education (SNAP-Ed)

According to the National Health and Nutrition Examination Survey (NHANES), one in two adults and one in three children are considered overweight or obese. When examining just the 2-5 year olds, about 11% of children ages 2-5 years of age are considered overweight or obese. These numbers reflect the

obesity epidemic which affects millions of Americans on a daily basis. In an effort to curb the rise in obesity, programs such as the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) were developed. The Cooperative Extension Service uses this educational program as a tool to teach residents how to manage their weight and address health related problems associated with a poor diet and lack of physical activity. By utilizing qualified registered dietitians and nutritionists, the District of Columbia Cooperative Extension Service, Center for Nutrition, Diet and Health is effective in providing ongoing nutrition education to the residents of the District of Columbia.

The Supplemental Nutrition Assistance Program-Education (SNAP-Ed), which is the nutrition education component of the USDA/FNS Supplemental Nutrition Assistance Program (SNAP) of the "Healthy, Hunger-Free Kids Act of 2010" which provided funding to establish the "Nutrition Education and Obesity Prevention Grant Program". The program educates individuals receiving and/or eligible for SNAP, formerly Food Stamps Program to adopt healthier lifestyles in accordance with the "Dietary Guidelines for Americans" and "MyPlate". Public school, daycare center, and Head Start program teachers are trained to implement the Color Me Healthy curriculum and the 48-lesson curriculum in nutrition and food safety among children and their families, improving their ability to select healthy foods, safely handle food, and properly prepare and store foods. Children in participating preschool/prekindergarten classes receive nutrition education lessons that incorporate hands-on experience with fresh fruits and vegetables. Parents are offered nutrition educational sessions covering topics related to their child and to their personal health. Social marketing techniques are used to expand the reach of SNAP-Ed messages alongside prevention and control of obesity in the targeted population.

Older adults at congregate meal and Commodity Supplemental Foods sites receive age, cultural and literacy-appropriate nutrition education and support to aid in achieving optimum health. Participants and families are provided with take home handouts, newsletters, and food demonstrations and recipes designed to improve their ability to select healthy foods, safely handle food, and properly prepare and store foods at home.

Five basic concepts are taught within the preschool/prekindergarten classrooms. These include: 1) Food safety/hand washing, 2) Vegetables, 3) Fruits; 4) Whole grains, Dairy and protein, and 5) Physical activity. We believe getting individuals to make positive changes around these topics will lead to healthier lifestyles and a reduction in obesity and overweight among the target groups. These topics are followed in order by the nutrition educator. One topic is taught each month, and the teachers continue the nutrition education during the remaining weeks of the month. Once all five concepts have been taught, the nutrition educator will cycle through them again using different approaches in order for the individuals to review and broaden their knowledge on each topic. In addition to the nutrition lessons in the classroom, parent workshops are held in order to address nutrition related questions and concerns. Each nutrition educator is assigned a number of D.C. public and chartered schools, daycare centers, and Head Start centers located throughout the District that serve low-income children ages two to five years old. The nutrition educator trains the teachers at each site on how to use research and evidence-based curriculum to incorporate nutrition, food safety, and physical activity education into lesson plans. The nutrition educator also works with the students in each classroom, as well as provides parent workshops on various health related topics. The nutrition educator partners and collaborates with the site's parent coordinator in order to set a date, time, and recruit parents accordingly for each meeting or workshop. The topics are taught in a variety of ways.

The program, SNAP-Ed, has become a household word in the District of Columbia, the metropolitan area, the region, and nationally. The program receives many requests from neighboring states to share its educational materials. Some of the successes and recognitions are as follows:

- Cornell Carter, Preschool/Head Start Teacher, Garfield Elementary; 2345 Alabama Ave., S.E. writes

...

"I've noticed the children are eating a lot more vegetables since the program has been introduced. Children like the adults are becoming more and more health conscious about things they eat and keeping healthy. My personal delight with the program is that it allows the children to try and learn better ways to eating healthier snacks. SNAP-Ed allows the children to have more a different type of conversation when asked "What did you learn in school today"

- Sheila Hensley, Prekindergarten/Head Start Teacher, Garfield Elementary School, 2435 Alabama Avenue, SE writes...

"SNAP-Ed has been great as well as the meals in the classroom for my students eating healthier food and being more willing to try new foods. Here are a few wonderful moments that remind me how favorable these activities have been. At lunch, children ask me daily to try things together. I count to three and we all try the same food at the same time. Some ask to try it again, which means they want us to all have another bite at the same time. Everyone replies, "mmmmmm" as we chew. There are constant discussions about how the food is squishy or crunchy or even how it cleans our teeth. Children tell each other to try a food. Children say, "Just a little and I will try it." Children remind friends not to say they don't like a certain food. Children discuss colors of foods. Children tell about asking their moms to buy a food we have at school. Children self-serve but still ask for seconds and thirds of greens. Children drink their milk and eat their greens "to grow strong". They say, "I am drinking my milk to grow strong." Children always eat whole fruit and usually a few children ask for a second. We have healthy fruits and vegetables for snack at our school. Children are eager to eat squash, broccoli, carrots, and all fruits. Pineapple is a favorite. Apples and oranges run a close second. Children discuss strong muscles, heart, and bones. They love the "beep, beep" heart healthy song. In Share the News, we turn and tell a friend about foods that are certain colors. They are eager to do this activity."

- Elizabeth Rich, Preschool Teacher, Potomac Lighthouse Public Charter School, 4401 8th Street, N.E. writes ...

"The PK3 students at Potomac Lighthouse Public Charter School have truly enjoyed and benefitted from the SNAP-Ed program. The scholars are provided with a piece of fruit for breakfast and for lunch every day. We have observed the scholars joyfully eating the fruit every day and commenting on the lessons you and the teachers have provided that reference the importance of eating fruit. The children have made comments such as "Fruit makes you stronger and healthy so you can run fast and throw a football". Sometimes the students come to school in the morning with a honey bun from the corner store or a sausage muffin from a fast food chain and they will often push these foods aside and take some fruit that the school has provided instead. They are very interested in how fruit grows and in the structure of the fruit itself. One scholar was served a whole pear and thought there was a "spider" on the bottom of the pear and was afraid. We showed him some pictures of pears growing to explain why the bottom of the pear looked like it did. Also, the children are more interested in eating a wider variety of vegetables. The school lunches come with a vegetable every day. Admittedly, they don't always look that appealing to our preschool kids. However, the lessons have encouraged the kids to be much more open to trying the vegetables and many kids report they like them a lot! The teachers always take care to point out the vegetables, name the vegetables, and talk about how the vegetables grow. The kids are very excited when they see a vegetable we have eaten during one of our lessons in class or have seen in the pictures in the kit you provided. The SNAP-Ed program so easily ties in with our curriculum. It ties into colors, shapes, textures and what we have learned about the human body and growing stronger and healthier. It has been very easy to incorporate and the parents are excited that their children are participating in the program. Thank you so much for continuing the SNAP-ED program at our school!"

Kids Cooking Classes/Kids Cooking in the Classroom

Kids Cooking Classes/Kids Cooking in the Classroom provides children aged 2-5 years with hands-

on cooking experiences. The foods include vegetables, fruits, whole grains, dairy, and protein. Research has shown that the more exposure preschool aged children have with healthy foods, the more likely they will be to engage in healthier lifestyles choices later in life.

Expanded Food and Nutrition Education Program-(EFNEP)

The program provides nutrition education conducted by trained paraprofessionals to low-income adults with young children and youth with emphasis on the following topics: nutritional needs and cultural heritage of audience; nutrition knowledge, skills, and attitudes necessary to improve diets; planning for daily food needs; knowledge and practice in food selection and preparation; knowledge of financial management relating to family food budget, uneven incomes, and local food resources; use and care of equipment used for food preparation, storage, and utilization; food safety, health, and sanitation practices; food practices that reinforce personal development of family members; gardening and food production techniques; food preservation practices; maternal and infant nutrition education which complements other programs and information received from health delivery systems; body weight, food intake, health and fitness; and referrals to other resources and assistance programs. The direct education takes place in small groups with a series of 6 to 8 sessions. Upon completion of the sessions, participated are graduated and receive certificates.

District of Columbia Food Handler Certification Program Module Project/Food Safety

This program is designed to conduct research and training to determine the appropriate educational level and methodologies needed to develop a food sanitation certification program. The program is designed to provide training for low literacy and hard-to-reach food handlers in the District of Columbia to gain national certification as food protection handlers/managers. This certification program will enable the local Department of Health to comply with the Federal Food Code, which recommends standards for regulations of the District's food service operations. The project is also designed to develop a model program for the District of Columbia and national-wide replication. Improvement of food handlers' behaviors and food handling practices that directly relate to food-borne illnesses will serve to deter the incidence of this critical health threat. It will also improve the confidence of stakeholders and consumers, and ensure the health of an international audience of customers coming and going in the Nation's Capital (Capitol) as well as residents in the metropolitan Washington area.

Team Nutrition Project

A nationally funded program by the United States Department of Agriculture to states that are working towards improving children's lifelong eating and physical activity habits through nutrition education based on the principles of the 2005 Dietary Guidelines for Americans and USDA's MyPyramid. The Team Nutrition training in Washington, DC was funded to support Child and Adult Care Food Program (CACFP) child development centers and family day care home food service professionals. A "FREE" ten lesson program on healthy, nutritious and safe meal service planning, preparation and presentation is offered to eligible sites. Training takes place at the University of the District of Columbia. At the 5th week 20 clock hours of Early Childhood Education Administration credits are awarded. Recipes for child development facilities are professionally demonstrated at the Capitol Area Food Bank. Resources including videos, recipes and the DC Team Nutrition Training Guide are provided to participants.

Farmers' Markets Nutrition Education

Farmers' Market Nutrition Education Program provides nutrition education at point-of-purchase for market goers. The program also provides on-site food demonstrations using fresh produce from the

market, nutrition education, recipes, and information on nutritional quality of foods sold at markets. Food demonstrations and cooking activities provide interactive instruction on healthy cooking techniques, modifying favorite recipes to include healthier ingredients by reducing the sugar, sodium, and fat. Classes are open to the general public. This is a seasonal program/activity.

4. Urban Families, Youth and Communities

4-H is the non-formal youth development program of the National Institute of Food and Agriculture (NIFA) of the U.S. Department of Agriculture. It is part of the land-grant university system of which the University of the District of Columbia is the land grant institution in the District of Columbia. Land grant universities have access to the most current knowledge and research related to youth development. 4-H provides young people, ages five through nineteen, in developing knowledge, skills and attitudes that will enable them to become self-directing, responsible, productive citizens, and contributing members of society. The 4-H program educates youth in arts and sciences, health and fitness, science, technology, environmental science, math, sewing and fashion design, cooking and healthy eating and a host of other subject areas while encouraging fellowship and service opportunities. 4-H continues to develop new projects for its members to study beyond agriculture and animal husbandry, including photography, conservation, cooking, public speaking, various sports, history, art, and other pursuits.

4-H Clubs

4-H provides youth development opportunities through a variety of delivery methods. The 4-H club is one of these. There are many variations of 4-H clubs. In general, 4-H clubs are organized groups of youth, who sometimes but not always, elect officers and are supported by adult volunteer leaders. A 4-H club conducts meetings and activities throughout the year, usually holding at least six official meetings per year, for at least 5 members from 3 or more families. Club meetings typically include a business portion, an educational program, and a group building or recreational activity. The clubs frequently offer opportunities for leadership, citizenship, community service and public speaking. It may meet in any location such as community centers, military bases, schools, and places of worship, and is authorized to use the 4-H name and emblem after becoming chartered. This program year we managed 36 4-H clubs in schools. Members of the clubs participated in other outside programs to include the **National 4-H Youth Science Day**-30 4-H Youth from UDC 4-H School Clubs participated in the National Youth Science Day Program at the National 4-H Council (it was a testing day so 4th and 5th graders from Janney Elementary School and 5th and 6th graders from SEED a Private residential school participated. The youth were featured on Fox Five News.

4-H Living Interactive Family Education (4-H LIFE) is a youth development program that addresses the needs of children with incarcerated parents. The goal of the 4-H LIFE program is to provide a strong, healthy, and nurturing family environment while helping the incarcerated parents become positive role models. The program consists of three components, including parenting skills classes, monthly planning meetings, and family club meetings.

In the Washington, DC community ex-offenders were transferred to a local prison and many children do not see their parents on a regular basis. These children also are often placed with other family members or are in the foster care system. When a parent is incarcerated the children are often confused about their parents moral beliefs, feel abandoned by their parents and experience low self esteem as a result of teasing and ridicule by peers. The 4-H Living Interactive Family Education (LIFE) program is a 4-H and family-strengthening program for children of offenders and their families. The target audience for the program is incarcerated parents and their children, grandchildren, and other family members. Incarcerated parents who participate in the 4-H LIFE program attend regularly scheduled parenting skills classes to develop and improve the skills needed to interact in a positive, age-appropriate way with their children.

The children participate in 4-H club activities, visit their parents with a group of other youth experiencing the same concerns and journal their feeling and regular booklets. When the parents re-enter the community they are better equipped to work with their children as a result of participating in the program and the children have developed better coping skills. In the District of Columbia last year over 300 parents completed the parenting education, financial budgeting, communications, domestic violence prevention programs and 4-H club classes. Approximately 127 youth visited their parents during the program year regularly. Visits were held once monthly in both the male and female portions of the prison. The youth participated in a variety of different 4-H club activities, ranging from beginning music classes to cooking and healthy eating. As their community service project they visited and served senior citizens at the Hadley Hospital Senior Care Facility. Fifteen youth also went kite flying. Skating and to the 150th Anniversary at USDA. The partnership for this program has been renewed and we have received additional funding to continue the program.

4-H International Media Club- was launched to connect 4-Hers from around the world with youth in the District of Columbia to allow them to understand their differences and similarities, while mastering media productions, interviewing techniques and research. Youth from our UDC 4-H Media Program meet with 4-H Club members from other countries via Skype to compare environmental and social challenges in their communities and share potential solutions. During this program year 4-Hers from Brightwood Middle School created four informational videos about their country, themselves, learning about media and what 4-H is all about. They visited the UDC media center where they were taught to use the equipment required to make a TV production and learned firsthand from the pros about making a production. Through our partnership with Microsoft, our 4-Hers communicated from the Microsoft store with 4-Hers in Liberia and Argentina. 36 youth participated in this program. The highlight of the program year was a visit from the National 4-H Council Board of Directors. Parent volunteer Brenda Gion shared that she did not know all of the things she learned about the city until she accompanied the children to interview the parks ranger about the monuments. She shared that her daughter was bashful and quiet and the program has improved her confidence.

4-H STEM consists of specialized programs designed to introduce and encourage participation in Science, Technology, Engineering, and Math disciplines among youth in the District of Columbia. The program is supported by the Alteria Foundation through the National 4-H Council and works collaboratively with UDC's STEM Center. While the program was new last program year 74 4-Hers began the program in the fall after we received funding Five college students completed training to become STEM volunteers and partnerships were developed with three DCPS schools, the District of Columbia National Guard and Bolling Air Force Base. New brochures and facts sheets were developed promoting the program and a partnership with Microsoft resulted in a robotics workshop for the 4-H club members from JC Nalle. The one day workshop involved the Microsoft staff teaching the 4-Hers the basics of robotics design and function and the big things that robot will be used for in the future.

4-H Summer Camp consists of hands-on learning projects designed for enrichment during the summer months. Located on the campus of the University of the District of Columbia, the camp includes opportunities for youth to explore new learning projects, develop new friendships, practice healthy eating and exercise, and have plenty of fun. The six week program is lead by Extension Specialist and agents and promotes goal setting and self discovery through trial and error. During this program year we hosted 40 4-H youth on campus for six weeks. The program areas included, learning to lead, self expression through art and music, electrical circuits and robotics, and Environmental Sciences. The youth visited the monuments, the channel 9 station where they toured the station and met with the staff. They sat quietly as the news was being broadcasted.

EnvironMentors is a sustainability-focused mentoring program which engages youth leaders in becoming active stewards of their communities and the environment. Over the course of the school year, students work with mentors to develop rigorous environmental science projects based on relevant

environmental circumstances in their communities. Upon completion of their chosen research projects, they develop lesson plans and present to an elementary school class, science fairs, and at the annual EnvironMentors Science Fair where they have a chance to compete for college scholarships. Hosted youth and members of EPA and NASA to introduce the program and introduce mentors to mentees. We have 45 youth and 20 mentors at this point. In an effort to recruit youth participants, EnvironMentors engaged with educators and students at seven schools in six wards to recruit, orient and train interested students. All told this entailed a total of 22 school visits. UDC EnvironMentors is currently working with educators and students from:

- School Without Wall Senior High School in Ward 2
- Woodrow Wilson High School in Ward 3
- Washington Math and Science Public Charter High School in Ward 5
- Eastern Senior High School in Ward 6
- Maya Angelou Public Charter School in Ward 7
- Thurgood Marshall Academy Public Charter High School in Ward 8
- Anacostia High School in Ward 8

Relationships Established:

- In an effort to recruit mentors, 12 separate Masters level student recruiting events at three District of Columbia universities were visited:

- The University of the District of Columbia
- American University
- Howard University

- In addition to the relationships developed with the participating schools, relationships have been established with the Teen Computer Resource Center at the Martin Luther King Jr. Memorial Library and also with the Academic Resource Library at UDC.

LifeSmarts Consumer Education for Teenagers creates savvy consumers and develops marketplace skills among teens in a fun and engaging format. Complementing high school curricula, LifeSmarts is run as a game-show style competition for 9th through 12th grade students. The program educates youth about the Environment, Technology, Legal Rights and Responsibilities, Health and Safety, and Personal Finance. Teams of four-five youth compete with other local teams. The winner of the state competition represents Washington, DC on a National Stage at the National LifeSmarts Competition. LifeSmarts is a program of the National Consumers League. This year 66 youth from eleven DC High schools with two seasoned veteran teams from Virginia, participated in an all day LifeSmarts program launch at the Google offices. The teams have been narrowed down to 30 players ready for the state competition.

Operation Military Kids serves children of deployed parents by hosting special events and training sessions to mobilize a support network consisting of youth, parents, and educators. "Ready, Set, Go" training is offered to educate communities about the needs of military families in the deployment cycle. The program also distributes "Hero Packs," Operation Military Kids-branded backpacks filled with a variety of items from partner agencies and local businesses, provided to military youth as a way of communicating thanks for the sacrifices that they make while their parents are deployed. This year we hosted 8 major events for children, four Ready Set Go Programs for the community and two deployment and reintegration programs. We implemented a spring break program just for military youth. 940 youth were served during the program year.

Health Rocks

Health Rocks is a healthy life program based on decision making and appropriate health knowledge with its beginning-level curriculum targeted at youth ages 8 to 12, and intermediate level targeted at youth ages 12 to 14. The experiential education program is facilitated by teen/adult leadership teams to help

youth learn key health messages and skills such as critical thinking, how to manage stress and peer pressure, how to communicate effectively, and how to analyze media messages. Special emphasis is placed on tobacco use prevention.

In the District of Columbia we offer youth and communities programming to reduce dependence on chemicals for problem solving and coping with the trials of life. Health problems that traditionally plague challenged communities are often related to poor decision making in youth and risky social behaviors. These issues can lead to trouble communities where adults can become dependent on drugs and are unable to contribute to the tax base in their communities. A lowered amount of taxes being contributed in a community results in lower quality schools, higher crime rates and a deduction in quality public services. Through the Health Rock Program youth ages 8 to 14 year olds, their families and communities work together to reduce tobacco, alcohol and drug use by youth in their communities. The program components promote improved communication skills for youth resulting in better conflict resolution tools being used in the family and community. Young people in the community receive information about the dangers and consequences of using tobacco, drugs and alcohol and are less likely to become dependent on chemicals to solve their problems. This propensity to avoid chemical use results in a reduced crime rate, parents that model better decision making about problem solving, and overall stronger communities. When people of any age improve communication skills they become better parents and partners in a community. Diego Lahaye. in two health fairs and provided the direct programming to more to 30 youth in the District of Columbia Public school system. He has put the program together with a fitness plan that involves emphasizes that you have to stay fit to be an athlete. The target for this program is 3,000 youth this year.

5. **Sustainable Energy**

This study concluded during the reporting period. The anaerobic digester (AnD) of organic waste processing started in the academic year 2009/2010 with the goal of designing and building 1000 gallons AnD equipped with sensors to monitor all parameters effecting operation and with a fuzzy logic controller to automate the control of the system parameters. Significant efforts were made to design the 1000 Gallon tank of the AnD, however, due to budget constraints, the design of the digester's tank was scaled down to 75 gallons and scaled back again to 35 gallons.

A comprehensive literature search was conducted to find the most efficient types and designs of a small AnD. The completed design splits AnD into two main parts; Mixer and Housing. The completed pro-engineering design of the digester can be summarized as follows:

For the Mixer part, the following activities have been completed:

1. Defining the overall specification of the mixer;
2. Developing the kinematic drawing of the mixer;
3. Defining the main components such as gears, and mixing blades;
4. The design of the mixing mechanism;
5. The design of the automated feeding mechanism; and
6. A comprehensive velocity analysis for the mixing mechanism.

For the digester Housing the following activities have been completed:

1. Selection of the main elements of the Housing and the types of material needed for their construction and designing a window to monitor the level of the waste inside the tank;
2. Designing the Housing Skelton;
3. Theoretical evaluation of the fluid dynamics inside the digester tank;
4. Simulation analysis of evaluate the stresses, exerted by the waste, inside the inner tank using the finite element analysis method and approximating the geometry of the entire tank with stress elements

(tetrahedrons) ;

5. Calculating the dimensions of the final metal sheets needed for the tank construction;
6. Defining the features of the tank including the types of insulation, temperature and pressure sensors needed, locations of the sensors, and the automatic feeding system.

In addition, the energy content of Bio-gas from various animals (Livestock wastes) was studied and the anticipated Gas yield compared. The study showed that the estimated gross energy content of approximately 30,000 Btu/head/day for dairy cow manure was two to three orders of magnitude higher than other animal waste products. The Net energy content however, will be dependent on the operating performance of the digester. Thermodynamics Analysis was done to calculate the Combustion of Methane gas and the heat exchange during the reaction. Our calculation shows that 1kg of Organic Material will produce 27.748 MJoules of heat energy.

Simulation tools and simulation benchmarks were used to evaluate and compare different sludge control strategies used to improve the efficiencies of the biological reaction processes, and to reduce their operational and environmental costs.

The Operational parameters affecting the anaerobic digestion process include:

1. Temperature of the digester: Anaerobic digestion will operate over a wide range of temperatures. However, there are two temperatures ranges where the digestion is most rapid, mesophilic (about 35°C) and thermophilic (about 55°C);
2. Pressure: the excess gas pressure inside the digester can exceed the maximum design pressure and damage the cover or its mountings;
3. The pH value: The pH value is especially critical in anaerobic digestion where important quantities of protons are released, eventually leading to acidification and process failure;
4. The presence of nutrients in the digester;
5. Concentration of volatile fatty acid (VFA) if present and its consistency;
6. The retention rate of waste materials;
7. Presence of toxic materials

Various commercially-available sensors for the Monitoring System were evaluated. Different types of sensors were selected as follows:

1. Temperature sensors: The selected sensors are 100 ohm RTD sensors in a 4-wire, Teflon insulated configuration. This provides an operating temperature range of -50 to 250°C. Fiberglass insulated wire is also available.
2. Pressure sensors: Industrial Process Pressure Gauges with 4½ and 6-inch Dials Black Phenol (PGH Series) or Aluminum (PGJ Series) Case.
3. Non-Contact ultrasonic liquid-level sensors: LVU40 series in conjunction with a PLC (programmable logic controller) they can be used for point level measurement.
4. Flow of gas sensors: The digital thermal mass flow meters types FMA-1600A and FVL-1600A Series mass and volumetric flow meters can be used to determine the mass flow rate.
5. pH electrodes: Cole-Parmer® Fast-Response Autoclavable Fermentation pH Electrodes can be used for pH ranging from 0 to 14.

Together, through integrated work, the Agricultural Experiment Station and the Cooperative Extension Service are planning purposefully, executing effectively, and stand committed to upholding our land-grant mission to impactfully serve the residents of the District of Columbia.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	31.8	0.0	3.5	0.0
Actual	47.7	0.0	12.6	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External University Panel
- External Non-University Panel
- Expert Peer Review

2. Brief Explanation

We have established a Merit Review Process for research/extension in Land Grant Programs that continues to work well at ensuring that research proposals are judged fairly and on their merit. For Hatch and Mini-grants offered through the Station, the process includes: the Development of a RFP; Solicitation of RFP; Receipt of Proposals; Review of Proposal Packets for Completion of Requirements; Peer Review; Director's Review; Completion of Required Forms for submission to USDA; Electronic Submission to USDA for expert panel review; USDA Approval; and Issuance of Award. The Peer Review panel includes representatives from various departments/schools across the University. An external panel from USDA, as well as other colleges and universities, and experts are used as necessary.

The Peer Review Committee assesses our program's proposed research/extension projects and activities based on the following criteria:

- Knowledge base of the research
- Adequacy of procedures and experiment to meet the objectives
- Feasibility of accomplishing the objectives
- Scientific merit of the proposed research
- Familiarity with work of others related to the proposal
- Outcomes and Impacts
- Appropriate budget for proposed research
- Budget Justification

All research/extension projects are monitored by the Director and Associate Director to ensure that objectives and timelines are being met. An annual progress report is required and is reviewed by the Station Director prior to electronic submission to USDA. All projects must include student learning experiences and findings are published in refereed journals, posters are developed and presented at conferences, and fact sheets or Information Documents are prepared and distributed to stakeholders. Students participate in conference presentations as well as research seminars.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Other (distribution lists; website)

Brief explanation.

Currently, our focus is on the underrepresented wards of the city, Wards 7 and 8. These are largely low income communities, characterized by extensive food deserts, high unemployment, high school drop out rates and other significant challenges. The outreach coordinator met with local government, faith-based organizations, community groups, and private organizations to sign groups up for attendance at planned Community Listening Sessions. Flyers were distributed to residents with a message emphasizing that we wanted to hear from them. We have reached out to seniors, single mothers, individuals transitioning from incarceration, ministers, community advocates, working class and middle class residents.

At Listening Sessions we encourage participants to give candid views on issues that affect them, their families, and communities. We discuss the roles and efforts of AES and CES and open the floor for dialogue. Residents have been very receptive and responsive. We have an electronic stakeholder survey that is conducted with the use of the clicker system. This excites the audience and really gets them involved in the process. This system allows us to track key data necessary for our assessment. We have a closing reception which generates fellowship, networking, and one-on-one time with our stakeholders. Additionally, stakeholder input is sought at both research and extension activities such as the Farmers' Market, workshops, seminars, and demonstrations throughout the eight wards of the District.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Use Surveys
- Other (workshops, seminars, Quality of Life Day Event)

Brief explanation.

The outreach coordinator works with community organizations and groups to identify participants for Community Listening Sessions. Flyers are produced and given to hosting organizations to advertise listening session events to the community. Coordinators from organizations have worked with us to establish these meaningful sessions by providing the venue and the audience. Our objective is to meet with residents and organizations across the eight wards of the District. Currently, our focus is on the underserved population of the city, residents residing in Wards 7 and 8. A large segment of this population are low income residents with many households lead by a single parent or, in some cases, a grandparent(s).

AES, CES, as well as AES and CES jointly, host a number of activities during the year to include workshops, seminars, demonstrations, training sessions, and an annual Farmers' Market on the University's main campus. At these events, stakeholder surveys are administered to willing participants and collected for assessment.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with invited selected individuals from the general public

Stakeholder input is collected via general dialogue with residents, community listening sessions, stakeholder surveys, and interviews.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- To Set Priorities

Brief explanation.

To Identify Emerging Issues

- Redirect Extension Programs
- Redirect Research Programs
- To Set Priorities

The input that we received from our stakeholders was reviewed and assessed by research and extension administrators. We determined that we are addressing many of the issues identified by stakeholders. However, there are areas that we have not yet tapped. Program modifications will be made so that we may improve our reach and our ability to address issues that are of significant importance to our stakeholders. At the same time, we are keenly aware of our responsibility to address critical issues of health, nutrition and literacy whether or not the surveyed at-risk populations deem them important. We are carefully reviewing and updating our Plan of Work. We want to be certain that we are serving our residents to the best of our ability based on resources available for our programs.

Brief Explanation of what you learned from your Stakeholders

Stakeholders are very concerned about the following:

- Safety of Foods: Growth, storage, and preparation of foods
- Community Resources and Economic Development: Jobs, training, sustainable neighborhoods
- Childhood Obesity: Healthy children; Healthy Eating; Activities for Children
- Urban Gardening: Growing their own food; exposure to different types of food, including ethnic crops; organic foods
- Diabetes Prevention: ways to reduce the high incidence of the disease; many have family and friends who are diabetic
- Healthy Food Choices: Eating better for better health and longevity
- Healthy Lifestyles: youth activities related to physical fitness and proper nutrition
- Sustainable energy: continued availability of resources for themselves, their children and generations to come

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1165360	0	886222	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	746599	0	651606	0
Actual Matching	746599	0	699653	0
Actual All Other	1873411	0	0	0
Total Actual Expended	3366609	0	1351259	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	100000	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Climate Change
2	Global Food Security and Hunger
3	Health, Nutrition and Childhood Obesity Prevention
4	Urban Families, Youth, and Communities
5	Sustainable Energy
6	Food Safety

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Climate Change

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
102	Soil, Plant, Water, Nutrient Relationships	20%		40%	
111	Conservation and Efficient Use of Water	20%		20%	
112	Watershed Protection and Management	20%		20%	
124	Urban Forestry	25%		0%	
141	Air Resource Protection and Management	5%		0%	
806	Youth Development	10%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	7.2	0.0	1.0	0.0
Actual Paid Professional	2.4	0.0	1.8	0.0
Actual Volunteer	22.0	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
86805	0	38426	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
86805	0	140125	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
86631	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Developed and distributed informational materials such as fact sheets and brochures regarding changes in natural resources and environmental issues in the District of Columbia.
2. Developed STEM program to engage 4-H youth in science, technology, mathematics, and environmental studies activities.
3. Soil testing in environmental laboratory.
4. Conducted environmental workshops and seminars on the effect of environmental degradation and water quality issues.
5. Hosted 175 DC Public School teachers and students for an Urban Agricultural Fair at Muirkirk Research Farm for demonstrations, mini-lectures and hands-on experiences in water quality; sustainable agriculture; weather technology; marine science; urban gardening; urban forestry; and environmental sustainability.

2. Brief description of the target audience

- 1) District of Columbia residents
- 2) DC Public School Teachers
- 3) Youth, Grades K-12
- 4) Urban gardeners
- 5) Storm and waste water operators
- 6) Landscapers
- 7) Nursery Owners

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1334	2222	835	0

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of articles published

Year	Actual
2012	36

Output #2

Output Measure

- Number of fact sheets published

Year	Actual
2012	9

Output #3

Output Measure

- Number of newsletter published

Year	Actual
2012	11

Output #4

Output Measure

- Number of workshops, demonstrations and technical assistance implemented.

Year	Actual
2012	106

Output #5

Output Measure

- Number of research projects completed

Year	Actual
2012	0

Output #6

Output Measure

- Number of soil, air and water samples test results

Year	Actual
2012	9

Output #7

Output Measure

- Number of informational materials distributed

Year	Actual
2012	5691

Output #8

Output Measure

- Number of conference presentations

Year	Actual
2012	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of program participants that will become more environmentally aware due to new knowledge from informational materials provided and workshop presentations
2	Percent of program participants that will implement new environmental skills to improve natural resources and the environment
3	Percent of soil, air, and water samples meeting EPA standards after implementation of research project.

Outcome #1

1. Outcome Measures

Percent of program participants that will become more environmentally aware due to new knowledge from informational materials provided and workshop presentations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	94

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Urban Gardening and Forestry Outreach program provides District residents with information and technical assistance for raising vegetable gardens with special consideration given to the challenges of food production in an urban environment. The forestry program's primary focus is on outreach and education about invasive plants and their effects on the ecosystem. Residents are educated about the concept of invasive species, the invasive plants that are established in the District as well as those incoming invasives that are not yet established, effective abatement techniques, and native plants that can be used in lieu of invasive plants. There is also a public demand for unbiased horticultural and IPM education for sustainable landscapes and gardens and conservation of natural resources.

What has been done

Activities for fiscal year 2012 include offering workshops/classes/trainings; invasive abatement events; site visits; demonstrations; development of curriculum, outreach, and educational materials; and providing technical assistance to District residents through phone, email, and in-person consultations.

-Conducted 77 site visits reaching all eight wards of the District

-Launched a web-based mapping application with invasive plant information on the UDC website (invasive.udc.edu)

-Held 19 classes/workshops/trainings

a. Taught invasive plant classes for the DC Master Gardeners, City Year Volunteers, Dumbarton Oak Park/Rock Creek Park Weed Warriors, and Casey Trees? Citizen Foresters

b. Co-taught six cohorts of top ten invasives to National Park Service Employees and volunteers at a DC Cooperative Weed Management Area Training

c. Taught Introduction to Common Garden Pests and Organic Pest Control at Rooting DC (an

- d. Taught Let's Get Growing to the Library of Congress, to three groups at the Washington Senior Wellness Center, and to Matthew Memorial teachers
- e. Hosted two workshops on campus, a soils workshop and a Backyard Habitats workshop, the latter of which culminated in the installation of two native plant demonstration gardens along Van Ness Street
- Co-led five invasive removal events
- Sat on the steering committee for the newly formed DC Cooperative Weed Management Area (DC-CWMA)
- Nine samples collected (wards 1, 2, 3, 4, 5 and 8)
- Maintained three demonstration gardens, including the installation of a new demonstration garden at Matthew Memorial Baptist Church

Results

- Mary Farrah presented with the Association of Natural Resource Extension Professionals' Silver Award for Long Publications for Plant Invaders in the District of Columbia
- Disseminated over 21,753 copies of the Plant Invader booklets to all eight wards in the District
- Reached 1,278 direct contacts, including 284 youths
- Invasive removal events resulted in:
 - a. 95 people volunteering over 285 hours
 - b. Volunteer hours valued at a total of \$9,579 (www.independentsector.org)
 - c. Mitigated invasive weeds on 10.79 acres of land
 - d. Volunteers represented DC Master Gardeners, City Year, Student Conservation Alliance, Casey Trees Citizen Foresters, and incoming freshman from George Washington University learned experientially about invasive plants, changing their knowledge, behavior, and the condition on the lands they worked on.

Evaluation results

For the invasive plant program, a survey was developed to assess change in knowledge and predict change in behavior and condition as a result of the class. Of the 108 people surveyed:

- 13% reported that they learned about invasive species for the first time during the class
- 100% felt the class was successful in explaining what makes a species invasive, and that they had a better understanding of invasive species as a result of the class
- 85% learned that a species they were already familiar with was actually an invasive species
- 99% reported that they were going to share the information they learned about invasive species with others
- 94% said they would not purposefully install an invasive plant into their landscape
- 95% said if given the opportunity that they would spend time removing invasive plants
- Class participants were asked to list the invasive species they'd learned about as a result of attending the class. On average, participants learned about five new invasive plants. In total, thirty-nine different invasive species were learned as a result of the class.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
124	Urban Forestry

141 Air Resource Protection and Management
806 Youth Development

Outcome #2

1. Outcome Measures

Percent of program participants that will implement new environmental skills to improve natural resources and the environment

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	85

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Invasive plants are recognized as one of the greatest threats to wildlife and natural ecosystems in North America. In the last several centuries many non-native plants have been introduced to the DC area, a city with large forested parks. Invasive plant species successfully compete with native plants for limited natural resources such as water, sunlight, nutrients, and habitat. They crowd out and displace desirable native vegetation, thereby reducing biodiversity and establishing monocultures. This upset to the ecological balance is felt throughout the ecosystem as those species whose diet and habitat consist of native vegetation can no longer survive in that locale. Some of the long-term implications of altering the ecosystem on such a large scale are forests that aren't able to regenerate, pollution of waterways, and the listing of species as endangered or threatened.

From consuming produce that is tastier and higher in nutritional value to decreasing CO2 emissions by harvesting as locally as your backyard, District residents are all "a buzz" about the many benefits of local food production. Urban agriculture has caught on, and unlike large-scale intensive agriculture operations, urban agriculture utilizes comparatively smaller spaces and focuses on diversified, edible crops. Many residents already subsidize what they buy at the grocery store through community garden plots and by growing in their backyards, but are in need of technical assistance with issues ranging from cultivar selection and planting dates to fertilizing, soil contamination, and integrated pest management. Yet, other District residents don't even have access to a grocery store, let alone yard space or a community garden. The Cooperative Extension Service works with District residents on both ends of the spectrum. We provide technical assistance the established gardeners, and also help the up and coming gardeners start their own gardens by providing free consultation, connecting them with available resources,

providing technical assistance, and when called for by helping them dig in?

What has been done

Activities for fiscal year 2012 include offering workshops/classes/trainings; invasive abatement events; site visits; demonstrations; development of curriculum, outreach, and educational materials; and providing technical assistance to District residents through phone, email, and in-person consultations.

- Conducted 77 site visits reaching all eight wards of the District
- Launched a web-based mapping application with invasive plant information on the UDC website (invasive.udc.edu)
- Held 19 classes/workshops/trainings
 - a. Taught invasive plant classes for the DC Master Gardeners, City Year Volunteers, Dumbarton Oak Park/Rock Creek Park Weed Warriors, and Casey Trees Citizen Foresters
 - b. Co-taught six cohorts of top ten invasives to National Park Service Employees and volunteers at a DC Cooperative Weed Management Area Training
 - c. Taught Introduction to Common Garden Pests and Organic Pest Control at Rooting DC (an urban gardening forum) and to a UDC Professional Science Master's communications class
 - d. Taught Let's Get Growing to the Library of Congress, to three groups at the Washington Senior Wellness Center, and to Matthew Memorial teachers
 - e. Hosted two workshops on campus, a soils workshop and a Backyard Habitats workshop, the latter of which culminated in the installation of two native plant demonstration gardens along Van Ness Street
- Co-led five invasive removal events
- Sat on the steering committee for the newly formed DC Cooperative Weed Management Area (DC-CWMA)
- Nine samples collected (wards 1, 2, 3, 4, 5 and 8)
- Maintained three demonstration gardens, including the installation of a new demonstration garden at Matthew Memorial Baptist Church

Results

- Mary Farrah presented with the Association of Natural Resource Extension Professionals Silver Award for Long Publications for Plant Invaders in the District of Columbia
- Disseminated over 21,753 copies of the Plant Invader booklets to all eight wards in the District
- Reached 1,278 direct contacts, including 284 youths
- Invasive removal events resulted in:
 - a. 95 people volunteering over 285 hours
 - b. Volunteer hours valued at a total of \$9,579 (www.independentsector.org)
 - c. Mitigated invasive weeds on 10.79 acres of land
 - d. Volunteers represented DC Master Gardeners, City Year, Student Conservation Alliance, Casey Trees Citizen Foresters, and incoming freshman from George Washington University learned experientially about invasive plants, changing their knowledge, behavior, and the condition on the lands they worked on.

Evaluation results

For the invasive plant program, a survey was developed to assess change in knowledge and predict change in behavior and condition as a result of the class. Of the 108 people surveyed:

- 13% reported that they learned about invasive species for the first time during the class
- 100% felt the class was successful in explaining what makes a species invasive, and that they had a better understanding of invasive species as a result of the class
- 85% learned that a species they were already familiar with was actually an invasive species
- 99% reported that they were going to share the information they learned about invasive species

with others

-94% said they would not purposefully install an invasive plant into their landscape

-95% said if given the opportunity that they would spend time removing invasive plants

-Class participants were asked to list the invasive species they'd learned about as a result of attending the class. On average, participants learned about five new invasive plants. In total, thirty-nine different invasive species were learned as a result of the class.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
124	Urban Forestry
141	Air Resource Protection and Management
806	Youth Development

Outcome #3

1. Outcome Measures

Percent of soil, air, and water samples meeting EPA standards after implementation of research project.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Currently, the Station is seeking research proposals from faculty to support climate change initiatives. With the recent hire of an Assistant to the Dean, who will also be responsible for assisting with climate change initiatives for our land-grant programs in research and extension, we expect that we will be able to begin work in the next fiscal year.

The Extension Agent who was responsible for Water Quality Education Programs is no longer with the Cooperative Extension Service. The employee's position was abolished as the result of mandatory right-sizing which affected all units across the University.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

This program requires further strengthening and development. We were able to accomplish some of our goals; however, there is still much work to be done via continuous improvement. The strongest element of this program has been our outreach efforts as follows:

1. Developed and distributed informational materials such as fact sheets and brochures regarding changes in natural resources and environmental issues in the District of Columbia.
2. Developed STEM program to engage 4-H youth in science, technology, mathematics, and environmental studies activities.
3. Soil testing in environmental laboratory.
4. Conducted environmental workshops and seminars on the effect of environmental degradation and water quality issues.
5. Hosted 175 DC Public School teachers and students for an Urban Agricultural Fair at Muirkirk Research Farm for demonstrations, mini-lectures and hands-on experiences in water quality; sustainable agriculture; weather technology; marine science; urban gardening; urban forestry; and environmental sustainability.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security and Hunger

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
102	Soil, Plant, Water, Nutrient Relationships	35%		40%	
205	Plant Management Systems	35%		40%	
216	Integrated Pest Management Systems	10%		10%	
721	Insects and Other Pests Affecting Humans	10%		0%	
806	Youth Development	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	1.0	0.0
Actual Paid Professional	4.8	0.0	6.0	0.0
Actual Volunteer	1978.0	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
158480	0	318418	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
158480	0	466674	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
49413	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- 1) Conducted field experiments in the use of composted waste as a soil amendment for growing vegetables in urban gardens at Muirkirk Research Farm in Beltsville, MD;
- 2) Facilitated workshops, training sessions, demonstrations, field activities, and farm tours for program participants to teach and update knowledge of sustainable agricultural techniques to establish, maintain, and protect both vegetable and flower gardens;
- 3) Developed and distribute informational fact sheets, brochures, and newsletters related to production and protection of urban gardens;
- 4) Participated in local, National, and international conferences and meetings on sustainable agriculture and urban gardening;
- 5) Provided pesticide safety education and recommendations for control while preventing environmental degradation; and
- 6) Maintained Master Gardening certification; trained gardeners participating in beautifying the city through volunteer hours.

2. Brief description of the target audience

- 1) District of Columbia residents
- 2) DC Public School Teachers
- 3) Youth - Grades 3-8
- 4) Urban community gardeners
- 5) Small rural farmers
- 6) Landscapers
- 7) Nursery owners

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	4665	11729	1743	2000

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of articles published
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of fact sheets published

Year	Actual
2012	7

Output #3

Output Measure

- Number of Newsletters published

Year	Actual
2012	24

Output #4

Output Measure

- Number of workshops, demonstrations and technical assistance implemented.

Year	Actual
2012	358

Output #5

Output Measure

- Number of research projects completed

Year	Actual
2012	0

Output #6

Output Measure

- Number of soil, plant and water samples test results

Year	Actual
2012	134

Output #7

Output Measure

- Number of informational materials distributed

Year	Actual
2012	27548

Output #8

Output Measure

- Number of conference presentations

Year	Actual
2012	13

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of program participants that will adopt urban gardening techniques learned from informational materials provided and workshop presentations
2	Percent increase in urban gardens using some compost material as a soil amendment
3	Percent of soil, plant and water sample results within acceptable crop production range
4	Percent increase in the growth of a variety of ethnic crops in home, school, and community gardens in the District of Columbia.

Outcome #1

1. Outcome Measures

Percent of program participants that will adopt urban gardening techniques learned from informational materials provided and workshop presentations

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	45

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is a public demand for unbiased horticultural and IPM education for sustainable landscapes and gardens and conservation of natural resources.

What has been done

The DC Master Gardener Program extended horticultural and pest management expertise to participant. The program trained volunteer horticultural educators. Participants received 50 hours of basic horticulture training and then agree to work in their communities to teach District of Columbia Residents how to cultivate garden spaces and manage landscapes sustainably using research-based information.

Results

271 (which includes 45 trainees) Master Gardeners and Trainees provided 9,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$33.61 per hour according to www.independentsector.org with a total value of \$302,490 in savings to the District of Columbia. In addition, 13,500 direct contacts were served by the Master Gardener Coordinator/Extension Agent. Forty-five (45) Master Gardener Trainees completed 50 hours of basic horticulture training, a final exam and 50 hours of volunteer hours. Various Master Gardener projects through all eight wards have been established which include schools, parks, beautification projects, landscape design, youth gardens, local and national botanical gardens, a hospice/nursing home, and partnerships with non-profit organizations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
216	Integrated Pest Management Systems
721	Insects and Other Pests Affecting Humans

Outcome #2

1. Outcome Measures

Percent increase in urban gardens using some compost material as a soil amendment

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Percent of soil, plant and water sample results within acceptable crop production range

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Percent increase in the growth of a variety of ethnic crops in home, school, and community gardens in the District of Columbia.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Health, Nutrition and Childhood Obesity Prevention

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
703	Nutrition Education and Behavior	25%		20%	
704	Nutrition and Hunger in the Population	10%		0%	
723	Hazards to Human Health and Safety	10%		0%	
724	Healthy Lifestyle	20%		20%	
806	Youth Development	10%		20%	
901	Program and Project Design, and Statistics	10%		20%	
903	Communication, Education, and Information Delivery	15%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	11.7	0.0	1.5	0.0
Actual Paid Professional	11.1	0.0	4.2	0.0
Actual Volunteer	20.0	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
70733	0	279632	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
70733	0	92854	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
709237	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Supplemental Nutrition Assistance Program-Education (SNAP-Ed):

- 1) Train-the-trainer
- 2) FFNews
- 3) Creative Curriculum
- 4) Color Me Healthy
- 5) Tickle Your Appetite
- 6) Nutrition Essentials
- 7) DCPS Nutrition Curriculums
- 8) 45 -Food Safety & Dietary Quality Lessons Developed

EFNEP Program:

- 1) Basic nutrition
- 2) Financial management related to food budgeting and shopping
- 3) Food selection and preparation
- 4) Food safety and sanitation practices
- 5) Health and physical activity
- 6) Referrals to other resources and assistance programs

Food Handlers Training and Certification

Instruction on food handler certification regulations
 DC Code Examination

Changing the Health Trajectory for Older Adults through Effective Diet and Activity Modifications:

- 1) A survey questionnaire was constructed, field tested, and validated in order to implement intervention strategies that will increase fruit, vegetable, and whole grain consumption in the multicultural elderly population in the District of Columbia.

2) The survey was administered by individual cognitive interview to 127 (33 male and 94 female) senior adult residents of the District of Columbia.

3) Subjects have been partitioned into the following groups: high and low fruit, vegetable, and whole grain consumers; high and low levels of nutritional knowledge; normal weight and obese; child caretakers for more than 8 meals a week; and diet change due to diagnosis of illness.

Cloud-based Fuzzy Data Mining for Diabetes Gene Pathway Analysis

During this period, we started to investigate the above proposed topic based on our previous years of research in diabetes gene analysis. We implemented the approach we proposed in the proposal and tested on real world dataset. Based on the experimental results, we identified problems of the original design. We searched literature for works related to the problem identified and revised the design accordingly. This new design has been implemented and tested. The results have shown that our approach is effective. That is, we can successfully generate and select high-quality gene pathway candidates from thousands of genes quickly taking advantage of parallel computing of a cloud platform. We are drafting the manuscript to submit for publication.

Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer

1) Continued and concluded 1) investigation of the molecular mechanism whereby g-T3 inhibits the growth of breast cancer cells; 2) determination if y-T3 induces apoptosis in MCF-7 breast cancer cells is ATF-3 dependent; and 3) determination whether y-T3 stabilizes p53 pathway via ATF3.

2. Brief description of the target audience

- 1) Adult men and women over the age of 65 who live in Metropolitan Washington, DC
- 2) DC Public School teachers
- 3) Students, grades Pre-K through 9
- 4) Children 2 -5 years of age
- 5) Pre-School/Headstart and Daycare teacher volunteers
- 6) Non-commercial agency staff members
- 7) Non-profits
- 8) Residential Homes
- 9) Overweight individuals and non overweight individuals from the same environment
- 10) Obese individuals and non obese individuals from the same environment
- 11) Low income residents living in multi-family housing
- 12) Researchers/Biologists
- 13) Low-income adults who are responsible for planning and preparing the family's food with emphasis on households with young children
- 14) Low-income youth
- 15) Non-commerical agency staff members
- 16) On-going participating food handlers

3. How was eXtension used?

Used materials posted

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	119779	0	20749	0

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Curriculum developed for various workshops, fact sheets for nutrition education for teachers.

Year	Actual
2012	141

Output #2

Output Measure

- Train the Trainer Food Stamp Educational Workshops: 2 hours a week by teacher volunteers; FFNews; Creative Curriculum; Color Me Healthy; Tickle Your Appetite; 5 A Day; DCPS Nutrition Curriculums; and Development of Food Safety and Dietary Quality Lessons

Year	Actual
2012	12608

Output #3

Output Measure

- Assess four day food diary data for the number of portions of fruits and vegetables for registered participants

Year	Actual
2012	127

Output #4

Output Measure

- Establish intervention/focus groups for registered participants consuming less than 5 servings of fruits and vegetables per day and identify the determinants of low consumption of fruits and vegetables.

Year	Actual
2012	0

Output #5

Output Measure

- Design and implement educational classes to assist registered participants with improving consumption of fruits and vegetables

Year	Actual
2012	0

Output #6

Output Measure

- Youth and adults will receive direct basic nutrition and food safety education

Year	Actual
2012	266175

Output #7

Output Measure

- Youth and adults will receive direct education on health issues and direct education and demonstration on physical activity

Year	Actual
2012	266175

Output #8

Output Measure

- Development of a manuscript for the publication of data on the mechanisms of action of g-T3 on

MCF-7 breast cancer cells.

Year	Actual
2012	1

Output #9

Output Measure

- Employ microarray experiments and a range of cellular and molecular biological techniques to determine the molecular basis of the action of γ -T3.

Year	Actual
2012	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percentage of parent participants who make better food choices (fruits/vegetables).
2	Percentage of participants who improved eating habits.
3	Development of broad applications for the inhibition of breast cancer cell proliferation and possibly cell transformation
4	Number of participants who increased physical activity and experienced weightloss
5	Number of participants who improved their dietary intake, including an increase in fruits and vegetables
6	Number of participants who improved food resource management practices such as menu planning and food shopping
7	Percentage of participants, who through information and interactive approaches, have adopted better eating habits thereby increasing their daily intake of fresh fruit and vegetables.

Outcome #1

1. Outcome Measures

Percentage of parent participants who make better food choices (fruits/vegetables).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2616

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The total number of households in the District of Columbia is 248,590 with a median household income of \$40,127.00. However, 80,336 or 32.3% of the households have income less than \$15,000.00. The percentage of families below the poverty level is 16.7% of which 47.7% are female households with children under 5 years of age. The District of Columbia obesity rate is 22.2%. The rate of obesity is highest among non-Hispanic African Americans children followed by Hispanic under 18 years of age. 50% of the children less than 18 years of age live in single-female-headed households and 54.2% of these children live below the federal poverty level.

What has been done

The EFNEP is impacting the lives of women with young children, pregnant women, caregivers of young children and youth with planned nutrition designed to improve the quality of life and reduce the levels of obesity. Planned direct nutrition education conducted by paraprofessionals in the areas of dietary quality, food safety, food security, food resource management and physical activity including hands-on cooking to small groups of adults and youth in 8-10 sessions of 2 hours each Assessment instruments included a 24-hour recall prior to the start of the interventions and upon completion of the interventions, behavior checklist and an exit interview. Upon completion of the planned sessions, participant graduated and received a certificate.

Results

The results revealed that 100% of the participants had positive knowledge, behavior and change in condition changes. Of the adults, 95.7% Improved in nutrition practices; 38.3% Improved in food safety practices; 74.4% Improved in physical activity rate; 51.0% Stretched food dollars farther 68.9% Improved in their diet. Of the youth, 88% now eat a variety of foods; 99% increased knowledge of the essentials of nutrition; 89% increased their ability to select low-cost, nutritious

foods. There was a positive decrease in calories from sugar, fats, sodium/salt, and an increase in fruits and vegetables, whole grains, low fat and fat free milk and physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

Outcome #2

1. Outcome Measures

Percentage of participants who improved eating habits.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	160965

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over the past 30 years, obesity rates among children and adolescents have almost tripled throughout the United States. An estimated 17% of children and adolescents aged 2-19 years are obese. The Healthy People 2010 goal of 5% obesity among children was not met. Obesity in children is defined as a BMI greater than or equal to the age-and sex-specific 95th percentiles of the 2000 CDC Growth charts. Childhood obesity is associated with an increased risk for developing type 2 diabetes, high blood pressure, sleep apnea, and high blood cholesterol www.cdc.gov/nchs/data. Children who are obese are also more likely to become obese adults, further increasing their risk for obesity related diseases, including heart disease and certain cancers. Obesity rates have affected low-income children at a disproportionate rate. Data published from the 2009 Pediatric Nutrition Surveillance System study showed that almost one third of the 3.7 million low-income children aged two to four years old were obese or overweight. Obesity in low-income children ages two to four years old has increased in the District of Columbia, from 10.9% in 1998 to 13.3% in 2008 (Center for Disease Control, Morbidity and Mortality weekly report, <http://www.cdc.gov/mmwr> with more boys being obese as compared to

What has been done

Nutrition education interventions were conducted with children 2-5 years of age in child daycare, preschool, and head start programs. The nutrition educator conducted hands-on nutrition education, cooking, and tasting activities with the children which included 12,608 nutrition

workshops/demonstrations and other food activities, train-the trainer (teachers) and parent workshops to enforce key messages taught in the classroom so that they will duplicate the same messages at home. The program used a pre and posttest retrospective survey at the end of each school year to measure the amount of knowledge and behavior change seen in children throughout the school year and participation in the program. Teacher observation surveys were collected in June 2012 at the end of the 2011-2012 school.

Results

All data were analyzed using the Predictive Analytical Software (PASW). As compared to the beginning of the school year, the following findings are reported: 89% responded positive to eating at least 1.5 cups of fruit daily; 80.7% responded positive to eating at least 1.5 cups of vegetables each day; 82.1% responded positive to drinking 2 cups of low fat or fat free milk products every day; 78.3% responded positive to eating at least 5 ounces of whole grains daily; and 90.5% responded positive to children being physically active daily; 92.2% were able to identify healthy food choices; 68.7% choose fruits or vegetables as a healthy snack during classroom parties; 60.3% now bring fruits and vegetables as a snack; 92.7% are willing to try new foods offered at school; 69.9 % have a balanced caloric intake from food and beverages with calories expended-; and 94.4% wash hand more often before handling food. The data overwhelmingly indicate that students did change their behavior as it related to eating fruits and vegetables, whole grains and fat-free or low fat products every day; and, became more physically active daily as part of a healthy lifestyle.

The second part of the survey had teachers to compare their behaviors at the end of the school year with the beginning of the school year. As compared to the beginning of the school year, teachers 87.1% of the time now offer healthy food choices to the students at parties and snacks; 84.4% now encourage students to eat breakfast; 84.4% now remind families to bring healthy snacks for school parties; 89.9% now encourage students to be physically active; and 86.1% of the teachers now make healthier personal food choices. Data for the teachers indicated the residual effects of the intervention also positively affected their behavior. Based on the analysis of teacher data, they also changed their behavior as a result of the nutritional interventions and nutrition educated implemented in their classrooms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Development of broad applications for the inhibition of breast cancer cell proliferation and possibly cell transformation

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tocotrienols are well understudied as compared to tocopherols. Gamma Tocotrienols (gamma-T3) induces programmed cell death or apoptosis in a variety of cancer cell lines including breast cancer cells but not in normal cells. The molecular mechanisms involved in gamma-T3 action are not well understood. The goal is to understand the molecular basis of the action of gamma-T3.

What has been done

In this completed part of the study we demonstrate that gamma tocotrienols (gamma-T3) induces apoptosis in MDA-MB 231 and MCF-7 breast cancer cells as evident by PARP cleavage and caspase-7 activation.

Results

Gene expression analysis of MCF-7 cells treated with gamma-T3 revealed alterations in the expression of multiple genes involved in cell growth and proliferation, cell death, cell cycle, cellular development, cellular movement and Gene expression. Further analysis of differentially modulated genes using Ingenuity Pathway Analysis software suggested modulation of canonical signal transduction or metabolic pathways such as NRF-2 mediated oxidative stress response, TGF-beta signaling and Endoplasmic Reticulum (ER) stress response. Analysis of ER stress related proteins in MCF-7 and MDA-MB 231 cells treated with gamma-T3 demonstrated activation of PERK and pIRE1alpha pathway to induce ER stress. Activating transcription factor 3 (ATF3) was identified as the most upregulated gene (16.8 folds) in response to gamma-T3. ATF3 knockdown using siRNA suggested essential role of ATF3 in gamma-T3 induced apoptosis.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Number of participants who increased physical activity and experienced weightloss

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of participants who improved their dietary intake, including an increase in fruits and vegetables

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of participants who improved food resource management practices such as menu planning and food shopping

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	8946

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The total number of households in the District of Columbia is 248,590 with a median household income of \$40,127.00. However, 80,336 or 32.3% of the households have income less than \$15,000.00. The percentage of families below the poverty level is 16.7% of which 47.7% are female households with children under 5 years of age. The District of Columbia obesity rate is 22.2%. The rate of obesity is highest among non-Hispanic African Americans children followed by Hispanic under 18 years of age. 50% of the children less than 18 years of age live in single-female-headed households and 54.2% of these children live below the federal poverty level.

What has been done

The EFNEP is impacting the lives of women with young children, pregnant women, caregivers of young children and youth with planned nutrition designed to improve the quality of life and reduce the levels of obesity. Planned direct nutrition education conducted by paraprofessionals in the areas of dietary quality, food safety, food security, food resource management and physical activity including hands-on cooking to small groups of adults and youth in 8-10 sessions of 2 hours each. Assessment instruments included a 24-hour recall prior to the start of the interventions and upon completion of the interventions, behavior checklist and an exit interview. Upon completion of the planned sessions, participant graduated and received a certificate.

Results

The results revealed that 100% of the participants who completed the program had positive knowledge, behavior and change in condition changes. 94% of the participants completed the program which includes completion of all of the program lessons. Of the adults, 95.7% Improved in nutrition practices; 38.3% Improved in food safety practices; 74.4% Improved in physical activity rate; 51.0% Stretched food dollars farther 68.9% Improved in their diet. Of the youth, 88% now eat a variety of foods; 99% increased knowledge of the essentials of nutrition; 89% increased their ability to select low-cost, nutritious foods. There was a positive decrease in calories from sugar, fats, sodium/salt, and an increase in fruits and vegetables, whole grains, low fat and fat free milk and physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #7

1. Outcome Measures

Percentage of participants, who through information and interactive approaches, have adopted better eating habits thereby increasing their daily intake of fresh fruit and vegetables.

Not Reporting on this Outcome Measure

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
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Family and Social Support)

Brief Explanation

The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) experienced approximately 55% budget cut.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The EFNEP results revealed that 100% of the participants who completed the program had positive knowledge, behavior and change in condition changes. 94% of the participants completed the program which includes completion of all of the program lessons. Of the adults, 95.7% Improved in nutrition practices; 38.3% Improved in food safety practices; 74.4% Improved in physical activity rate; 51.0% Stretched food dollars farther 68.9% Improved in their diet. Of the youth, 88% now eat a variety of foods; 99% increased knowledge of the essentials of nutrition; 89% increased their ability to select low-cost, nutritious foods. There was a positive decrease in calories from sugar, fats, sodium/salt, and an increase in fruits and vegetables, whole grains, low fat and fat free milk and physical activity.

The SNAP-Ed results were as compared to the beginning of the school year, the following findings are reported: 89% responded positive to eating at least 1.5 cups of fruit daily; 80.7% responded positive to eating at least 1.5 cups of vegetables each day; 82.1% responded positive to drinking 2 cups of low fat or fat free milk products every day; 78.3% responded positive to eating at least 5 ounces of whole grains daily; and 90.5% responded positive to children being physically active daily; 92.2% were able to identify healthy food choices; 68.7% choose fruits or vegetables as a healthy snack during classroom parties; 60.3% now bring fruits and vegetables as a snack; 92.7% are willing to try new foods offered at school; 69.9 % have a balanced caloric intake from food and beverages with calories expended-; and 94.4% wash hand more often before handling food. The data overwhelmingly indicate that students did change their behavior as it related to eating fruits and vegetables, whole grains and fat-free or low fat products every day; and, became more physically active daily as part of a healthy lifestyle. The second part of the survey had teachers to compare their behaviors at the end of the school year with the beginning of the school year. As compared to the beginning of the school year, teachers 87.1% of the time now offer healthy food choices to the students at parties and snacks; 84.4% now encourage

students to eat breakfast; 84.4% now remind families to bring healthy snacks for school parties; 89.9% now encourage students to be physically active; and 86.1% of the teachers now make healthier personal food choices. Data for the teachers indicated the residual effects of the intervention also positively affected their behavior. Based on the analysis of teacher data, they also changed their behavior as a result of the nutritional interventions and nutrition education implemented in their classrooms.

The Food Handler Certification Program results revealed a 100 pass rate on the national examination. The mean score of 68.6% on the pretest; mean score of 91% on the posttest; mean score of 83% on the DC Code exam; and a mean score of 89% on the national exam; 100% of the participants scored the minimum of 70% on the posttest and the national exam.; 100% of the participants are now employed in the food service industry. Many of the participants were reentering residents of the District of Columbia.

The UDC Farmers' Market results showed that 891 individuals received nutrition education and food demonstrations at its Saturday market from June 23, 2012 through November 10, 2012. The recipes demonstrated included local food being sold at the market. Some of the recipes included: raw vegetable salad, fruit salsa, grilled tofu and vegetables, orange and beet salad; tomato, corn and black bean salsa, linguine with vegetables, stir fried vegetables with tofu, eggplant salad, roasted zucchini lasagna, spinach waldorf salad with cinnamon apple dressing, vegetarian tofu chili, red potato salad, gazpacho, minestrone soup, and egg mexicali. Some of the recipes were repeated based on popular demand.

Key Items of Evaluation

1. Increased intake of fruits and vegetables
2. Pass percentage on the national exam
3. Children eating the recommended amounts of fruits and vegetables
4. Increase physical activity for all groups

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Urban Families, Youth, and Communities

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
602	Business Management, Finance, and Taxation	10%		0%	
608	Community Resource Planning and Development	10%		0%	
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	10%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%		0%	
806	Youth Development	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	11.9	0.0	0.0	0.0
Actual Paid Professional	16.6	0.0	0.0	0.0
Actual Volunteer	287.0	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
307054	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
307054	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
252171	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- 1) Leadership Development Meetings
- 2) Woodworking Projects
- 3) Language Program - Spanish
- 4) Gardening Projects
- 5) Computer Labs
- 6) Nutrition Program
- 7) Water Quality and GIS Technology
- 8) Tutoring: Tutors assigned to after-school program
- 9) Curriculum Development
- 10) Fact Sheets
- 11) Newsletters
- 12) Financial Literacy Sessions/Workshops
- 13) High School Financial Planning Program
- 14) Videotape series with Co-op Information
- 15) Co-op Groups
- 16) Demonstrations for Home Repair
- 17) Community Business entry-level training

2. Brief description of the target audience

- 1) Youth
- 2) Adults
- 3) Seniors
- 4) Military Personnel
- 5) DC residents
- 6) College students
- 7) Ex-offenders
- 8) Low to moderate income residents
- 9) First-time buyers
- 10) Low income homeowners
- 11) Small, new start, home based businesses

3. How was eXtension used?

eXtension was used for professional development and training for youth. We borrowed information about evaluations and impact and programming ideas about youth development.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	48090	54063	19202	3600

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Curriculum developed for various parenting workshops, seminars, support groups, fact sheets, and newsletters.

Year	Actual
2012	12

Output #2

Output Measure

- Number of participants in parenting workshops.

Year	Actual
2012	350

Output #3

Output Measure

- Number of parenting support groups formed.

Year	Actual
2012	4

Output #4

Output Measure

- Conduct a minimum of 50 sessions in the area of financial literacy.

Year	Actual
2012	8

Output #5

Output Measure

- Conduct 15 sessions per year for junior and senior high schools in the District of Columbia on financial planning.

Year	Actual
2012	19

Output #6

Output Measure

- Develop newsletter and/or fact sheets for District residents so they can perform basic/advanced repairs in and around their home.

Year	Actual
2012	0

Output #7

Output Measure

- Conduct hands-on workshops for District residents in basic and advanced home repair.

Year	Actual
2012	0

Output #8

Output Measure

- Percent increase in the number of 4-H clubs throughout the city.

Year	Actual
-------------	---------------

2012 10

Output #9

Output Measure

- Youth will receive training in the areas of sewing, computer technology, and geospatial technology.

Year	Actual
2012	160

Output #10

Output Measure

- Youth will receive leadership development training through conferences and special programs.

Year	Actual
2012	375

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of children who have increased their knowledge of the essential elements of team work through participation in 4-H club activities.
2	Number of children who demonstrate responsibility as a result of participation in 4-H Program activities. participation.
3	Number of parenting workshop participants who have used their knowledge of support services available to apply for assistance in an effort to meet some of their parenting needs.
4	Number of DC residents who participated in a Financial Literacy workshop who have improved their financial situation via establishing a household budget, personal savings and/or a checking account; purchase of savings bonds; establishment of a money market account or Certificate of Deposit.
5	Number of participants able to make repairs as well as communicate with contractors in a professional manner.
6	Number of Youth demonstrating an immediate and long-term commitment to civic engagement.

Outcome #1

1. Outcome Measures

Number of children who have increased their knowledge of the essential elements of team work through participation in 4-H club activities.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	16720

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Teens in the District of Columbia are unaware of the shift of careers toward environmental issues and avoid topics related to science. Additionally, there is a trend among urban youth towards purchasing expensive tennis shoes and clothing to impress their peers and boost their self image without regard for the dangerous patterns of unreasonable spending that could follow them into adulthood. In the District of Columbia the incidents of HIV, AIDs, diabetes, high blood pressure and childhood obesity are among the highest in the country. Our youth are not prioritizing protecting their health. Finally our teens need to stay on the cutting edge of technology to be competitive in the workforce as they move toward adulthood.

What has been done

We hosted 66 youth in the LifeSmarts Consumer Education Competition information Orientation. Teens learned about Environmental Science, Health and Safety, Technology, Legal Rights and Responsibilities, and Personal Finance to prepare for a game show competition. 11 teams participated and they will compete at the state competition here at UDC in March 2013.

LifeSmarts Teams still active include:

- LifeSmarts Columbia Heights High School ward 1
- LifeSmarts Coolidge Senior High School ward 4
- LifeSmarts Theodore Roosevelt High School ward 4
- LifeSmarts Arch Bishop Carroll High School ward 5
- LifeSmarts McKinley Technology High School ward 5
- LifeSmarts Eastern High School ward 6
- DC Preparatory High School

These clubs meet with their coaches in their schools at designated times.

Results

Participants develop teamwork skills, enhanced self-esteem, verbal communication skills, and leadership abilities and have fun in the process. LifeSmarts changes behavior toward better decision-making and better use of money and resources. It provides teens with a good understanding of their consumer rights and responsibilities.

100% of teens participating in the LifeSmarts programs report being shocked about the health disparities in their communities, 60 % report making healthier food choices, 70% plan to do more to protect themselves from becoming victims of health related concerns, 40% report making better purchasing choices, and 80% report learning something about technology they did not know.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Number of children who demonstrate responsibility as a result of participation in 4-H Program activities. participation.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	12604

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In the high risk community around the 4-H LIFE PR Harris 4-H Thinking Club, the youth need to take responsibility themselves and for their community. Their parents are incarcerated and they need to understand they are not helpless. This is also an area where childhood obesity is a major concern; there are many fast food establishments and few grocery stores or markets. Old patterns are not easy to change. The very best thing about this project was that parents attended with the children regularly.

Pregnant Hispanic teens want to learn about nutrition, and parenting. This program began two years ago and continues with new participants each year. 25-30 youth a session)

What has been done

Cooking classes were provided with demonstrations that allowed them to prepare health meals for themselves. For 16 weeks they learned why it is important to eat right and remain physically active. Ida Harrington, a volunteer nutritionist from their community worked with them weekly. Their care givers were also present. They participated in physical activities to include exercising on Nintendo Wii, bowling in their community with their caregivers and flying kites and running outside. As a community service activity they volunteered in separate groups at the Hadley Seniors Center serving seniors.

Pregnant teens received nutrition and parenting classes weekly. (360 over the year)
They participated in a one day financial planning class. (offered monthly)

Results

The youth learned to cook and caregivers report a change in healthy eating at about a 40% rate. The caregivers report that the children cook the health snacks that they really liked. Caregivers (persons caring for the children while their parents are in prison) report preparing healthier meals but still using fast food sometimes. 70% report using fast food once a week compared to three times weekly.

The youth are continuing their service to the senior citizens. All of the youth involved report enjoying working with the seniors in their neighborhoods and feeling good about giving back in their community. Eight adult volunteers accompanied the youth to Hadley for every visit. Caregivers report seeing greater confidence in the youth about their abilities to help others and a willingness to help out at home at a rate of 80 %.

This is an area where childhood obesity is a major problem and the area is a food desert. Fast food habits will take time to change, but the cooking classes helped alot. during this reporting period 50 youth participated inthis program.

95% of the teens report benefiting from the 4-H program, 60% report eating better, 80% report using resource information. Of parents complitng the saurveys 70 % report seeing their teen do something they did not do before the training more responsibly,.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Number of parenting workshop participants who have used their knowledge of support services available to apply for assistance in an effort to meet some of their parenting needs.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	350

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rising numbers of children are affected by the incarceration of a parent. As of 2006, an estimated 7,476,500 children had a parent who was incarcerated or under correctional supervision, and the number of children with an incarcerated father increased 77% from 1991 to 2004 (Glaze & Maruschak, 2008). Families affected by parental incarceration face many challenges: separation, stigmatization, disruption in the home environment, and the loss of family income. These challenges have been associated with negative outcomes for children, including poor parental bonding, internalizing and externalizing disorders, and low school achievement (Parke & Clarke-Stewart, 2001).

Despite the increasing number of families affected by incarceration, few correctional facilities provide family strengthening programs (Day, Acock, Bahr, & Arditti, 2005). In fact, only about 10% of fathers in state prison report participating in a parenting class (Glaze & Maruschak, 2008). This gap represents a lost opportunity to intervene with at-risk families to improve family functioning, particularly during the critical period before reentry.

In the Washington, DC community ex-offenders were transformed to a local prison and many children do not see their parents on a regular basis. These children also are often placed with other family members or are in the foster care system. When a parent is incarcerated the children are often confused about their parents moral beliefs, feel abandoned by their parents and experience low self esteem as a result of teasing and ridicule by peers. The 4-H Living Interactive Family Education (LIFE) program is a 4-H and family-strengthening program for children of offenders and their families. The target audience for the program is incarcerated parents and their children, grandchildren, and other family members. Incarcerated parents who participate in the 4-H LIFE program attend regularly scheduled parenting skills classes to develop and improve the skills needed to interact in a positive, age-appropriate way with their children.

What has been done

In the District of Columbia last year over 350 parents completed the parenting education, financial budgeting, communications, domestic violence prevention programs and 4-H club classes. The children participate in 4-H club activities outside of the correctional facility, visited their parents with a group of other youth experiencing the same concerns and journal their feeling regularly. Visits were held once monthly in both the male and female portions of the prison. The youth participated in a variety of different 4-H club activities, ranging from beginning music classes to cooking and healthy eating. Parents also participated in 4-H club activities inside the correctional facility and they conducted club activities during visits with the children. Six workshops were presented for Caregivers (adults caring for the children while their parent is incarcerated)

Results

In general, children with involved fathers are less likely to drop out of school, use drugs and alcohol, commit crimes, and become teenage parents (Mbwana, Terzian, & Moore, 2009). 78% if

incarcerated parents report an interest in changing from the traditional form of discipline that they learned which can cause some children to feel demeaning and unsupported feelings to a more conventional method of talking and taking away privileges, 80 % report an interest in preparing more healthy meals when they leave prison. Prison officials report 60%of parents in the program show signs of being more cooperative and happy after visits. Agents observe parents using parenting skills at visits regularly. 100 % Males parents report feeling closers to their families and children because of visits and letters.

One female inmate had her sentence reduced by six months when sharing with the judge the things she learned in the 4-H parenting class.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #4

1. Outcome Measures

Number of DC residents who participated in a Financial Literacy workshop who have improved their financial situation via establishing a household budget, personal savings and/or a checking account; purchase of savings bonds; establishment of a money market account or Certificate of Deposit.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of participants able to make repairs as well as communicate with contractors in a professional manner.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of Youth demonstrating an immediate and long-term commitment to civic engagement.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	12406

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Operation Military Kids serves children of deployed parents by hosting special events and training sessions to mobilize a support network consisting of youth, parents, and educators. "Ready, Set, Go" training is offered to educate communities about the needs of military families in the deployment cycle. The program also distributes "Hero Packs," Operation Military Kids-branded backpacks filled with a variety of items from partner agencies and local businesses, provided to military youth as a way of communicating thanks for the sacrifices that they make while their parents are deployed. This year we hosted 8 major events for children, four Ready Set Go Programs for the community and two deployment and reintegration programs. Speak Out For Military Kids (SOMK)

SOMK is a youth-led, adult supported project that generates community awareness of issues faced by youth of military families.

What has been done

The 4-H OMK Summer camp provided youth with an opportunity to develop, or fine tune important life skills such as, Public Speaking, Problem Solving, Critical Thinking, Team Building, and Emotional welfare. Youth shared experiences with each other and learned how people just like themselves deal with being a military child.

There was also a summer camp program for military youth, eight yellow ribbon programs and Military Family Fun Day's were presented in a group-format, free of charge to military families. This year, Washington D.C. Operation Military Kids participated in 5 Military Family Fun Day events.

Results

90% of surveyed parents report appreciation of the 4-H program reveal positive feedback about the camping programs experiences by the youth.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Community Support)

Brief Explanation

The 4-H program needs funds to keep grant funded positions open throughout the program year.

Some of our staff on grant funds were unable to work the full twelve months. We lost and excellent agent as a result of limited funds.

We need a facility just for the 4-H program for youth in the District of Columbia.

We need more resources to purchase food cards for cooking classes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Title: District of Columbia LifeSmarts Program/ 4-H

Issues/Concern:

According to the National Consumers League American teenagers have an average spending power of about \$5,000 per year, impacting the economy to the tune of \$125,000 billion annually. Not only do teens spend their own money, they direct billions of dollars in household spending by parents and caregivers.

Yet most teenagers lack the skills and knowledge to evaluate risks and opportunities and make informed decisions in today's marketplace. Stronger literacy skills and better knowledge about technology, consumer rights and responsibilities, personal finance, health and safety, and the environment can help to ensure that teenagers make good choices. Schools, teachers and adult mentors who want to provide students with practical, real-world skills don't always know where to start. LifeSmarts and 4-H can help.

What has been done?

In partnership with the National Consumers League, the Farm Bureau and Google we hosted 2 training camps with a total of 190 participants to help teachers and students in the District of Columbia explore real-world applications and gain knowledge in personal finance and consumer issues. Students learned, competed, and had fun. Educators gained new teaching resources and competition strategies. In 2012-2013 program year there were 23 teams registered as LifeSmarts teams. This program has tripled over the last three years.

Impact:

From participating in the training camp participants reported in the evaluation tool that the new skills that they learned or information that would be useful to them included.

Money management

Learning about Google
The definitions of new terminology
Health and safety tips
I learned info in the fields of law, health, the environment and etc.
I will be more aware of business interactions around me
How to keep myself safe on the internet
Info I learned on all the topics

Title: District of Columbia 4-H Robotics and the First Lego League

Issues/Concerns:

There is a declining trend in our nation's science, engineering, mathematics, and technology workforce. By the year 2013, 4-H programs across the nation had a bold goal to engage one million new scientists. In the District of Columbia, there by the year 2016 the top paying jobs will be in the fields of STEM education. 4-H has developed a comprehensive robotics program to inspire young people and develop an early interest in robotics engineering and technology.

What has been done?

The District of Columbia 4-H Robotics is delivered through 4-H clubs, camps, school enrichment, and after-school programs nationwide. Two teams of 10 students each met twice a week for 2 hours each meeting from September through November. Over the course of 12 weeks, these students worked more in depth on the programming of robots they created in order to perform tasks on the First LEGO League (FLL) playing field. Through the program youth learned how exciting science, technology, and engineering can be. Research and problem solving are *integral* parts of these fields and keys to the success of any real-world engineering team.

Impact:

Each team had the opportunity to research a real world problem in the area in food safety. They then developed an innovative solution to the problem identified. Then developed an innovative solution to the problem identified. The two teams competed in DC/VA FLL in November. Students from the teams spent the day running their robot built by their team through as many tasks as possible within time limits. They also presented their research project to a panel of judges. The third portion of the event was a team building project in which judges evaluated the ability of the students on the team to work together cooperatively and demonstrate "gracious professionalism" to everyone

EnvironMentors

Increased Environmental Issues Awareness

Participants initially reported, through informal surveys and show of hands, considering the environment to be important, though in general many of the youth did not have any depth or breadth of knowledge about key environmental issues. In addition, many of the youth reported to not understand their relationship to the environment, i.e.; how they impact or are impacted by, their environment.

EnvironMentors participants gained exposure to a variety of environmental issues through various mediums including field trips, panel discussions, and course topics.

The participating youth are now able to discuss several environmental issues with clarity. They are able to explain how their actions can impact the environment and they also express an awareness of some of the ways in which they are impacted by the health of the environment.

As an example: the EnvironMentors group went on a field trip to Kenilworth Aquatic Gardens. On this trip the youth learned about invasive plant species. At the conclusion of the trip the youth reflected that they were surprised at how many invasive plant species there are, and some youth were even able to recognize for the first time that they had invasive species growing in their own yards.

Understanding and Engaging in Environmental Stewardship Practices

A student survey revealed that the most commonly recognized environmental stewardship practice was recycling. Many of the youth reported that there was some form of recycling program at their schools. Many of them stated that they themselves did not always use the recycling facilities at their schools. Further, many of the youth reported not recycling at home though there was a small number of youth who reported that recycling is part of their family's practices.

Environmental stewardship concepts are reinforced throughout the program. As an example the healthy snack that is offered at the beginning of each session is designed to yield only recyclable and compostable waste. The youth not only engage in recycling but, at the end of each meeting the EnvironMentors group surveys the refuse left from the snack and activities. Refuse is categorized as recyclable, compostable, and garbage. Through this process students are able to articulate how planning and preparation can reduce end use waste. They are also now able to describe what a sustainable practice is such as reusing the materials used during the meeting sessions.

Improved Scientific Ability and Confidence

All the youth reported to have taken science classes in school, though, only a small percentage reported having engaged Environmental Science curriculum specifically. Also, only a small number of youth reported to have confidence in their ability in doing science or

Competencies are demonstrated through reinforcing task activities that accompany each lesson. On the whole, the youth have demonstrated comprehension of the material covered by adeptly completing the task activities. The youth are generally also able to reflect on the previous session's content in a complete and confident manner at the beginning of each meeting session.

Key Items of Evaluation

Concerns: At Brightwood Educational Center the volunteer leader reported that the youth at that institution were shy away from leadership role and public speaking. Also I was informed by the Principal that they have TV equipment that hasn't been used for a long time.

What has been done: The Principal and the volunteer leader identified students who had these particular issues and also they might be interested in Media stuff. As a TV and Film producer I taught them how to use the cameras, microphones, tripods, and the phases of TV production. After that, we produced two food tasting programs where students asked their peers and their teachers to do the taste. Also they were participating at the CAUSES, AG Fair where they took pictures and interviewed the students who participated at the event and the UDC staff as well. The programs were successful so we jump to the next stage,

which was an International Film Club. They were working with students from Liberia and Argentina. In order to make the first documentary we traveled around the city and conducted several interviews. Also the students had several videoconferences with their peers around the world. They learned about different cultures and ways of thinking.

Later on, they had a trip to UDC Channel 19 where they met the director of the station and were allow using the professional equipment and shooting a small portion of a program.

Impact: At the beginning of this program, I found that it was extremely difficult to get the students interested, and one of the main reasons was because most of them were shy. So after they felt confident with the use of the equipment, they began to show their skills and became more involved. As I was struggling to find students who were supposed to be in front of the camera, later on, I was struggling to find those who were behind it! Everybody wanted to talk, do interviews and virtually meet their peers from other parts of the world via Skype.

I could identify leadership in most of them. After the first semester, most of the members of the crew have their places assigned. The cameraman and his assistant, the host, and the producers were positions that I didn't have to ask for volunteers to carry out. That reflects that students were taking roles where they felt most comfortable.

Concerns: At Barbara Chambers Children's Center the volunteer leader reported that the youth at that institution needs to enroll in activities that keep them away from bad influences and also to encourage leadership role and involved them in some extracurricular activity.

What have been done: The volunteer leader identified teenagers who had these particular issues and also they might be interested in join a photography club. I taught them how to use the cameras, tripods, different ways of taking pictures, and also how the brain play with our senses (such us colors are made by the brain). After the first 4 classes we went out to take pictures. We visited several places, such us the National Zoo, Arboretum, National Natural History Museum, and several monuments around the city.

They also competed at the National Archives photography contest and they had an exhibition at the CAUSES AG Fair. They are ready to find more events where they can show their work.

Impact: The teenagers at Barbara Chambers showed great attention at the topics that were taught, especially the ones related to how our brain plays with the senses. Several times the traveled by themselves to parts of the city that they never been before. They also began to search for photography contests that they could participated. Furthermore, later on the program, they introduced more of their friends to join our program.

Concerns: At Brightwood Educational Center the volunteer leader reported that the youth at that institution needs to be connected with their parents to reinforce their confidence and their relationship between them.

What have been done: The volunteer leader identified the students and their parents

who had these particular issues. We created a nutrition classes with the help of the Center for Nutrition, Diet, and Health (CNDH) who provides us the certified nutritionist Aida Harrington who was in charge of the classes. Since most of the parents were Spanish speakers I did the translation for them. The club consisted in 9 classes in which the students and parents learned how to cook healthy food, how to buy smart at the supermarket, how to check the labels of the food, how to created healthy and funny snacks, and how to distinguish the benefits between eating right and not.

Concerns: At Brightwood Educational Center the volunteer leader reported that the youth at that institution were shy away from leadership role and public speaking. Also I was informed by the Principal that they have TV equipment that hasn't been used for a long time.

Impact: At the beginning of this program, the agent noted that that it was some kind of tension between the some parents and their kids but as the classes were going on, the relationship became fluently and we can feel how the kids trust their parents. Also, the joy of both, parents and students, after their finished the elaboration of some meals. At the end of the program they were interesting in get more information from Aida especially about get more recipes to cook healthy food. 80 % of the parents reprots that their relationships remain strong after the program activities have concluded.

TITLE: The University of the District of Columbia (UDC) 4-H and the Center for Youth Development have a mission to expose urban students to science, technology, engineering, and mathematics (STEM) disciplines.

RELEVANCE: The population in the District of Columbia identifies mostly as the underserved population, in which, this population is underrepresented in STEM professions. Employment projections of the Bureau of labor Statistics states that a student out of high school pursuing a career in STEM is more likely to make 59.6% more than non-STEM positions. The Labor Department projects that future occupations are requiring workers to have more knowledge and experience in STEM. 4-H Youth, Engagement, Attitudes and Knowledge (YEAK) Survey found that "by providing engaging out-of-school programming, 4-H Science programs have the potential to strengthen participants' interest in pursuing education and careers in the STEM fields."

RESPONSE: With the initiatives from 4-H, the STEM Leaders Program launched STEM programming by under the National 4-H guidance completing various projects to enrich the classrooms, and engaged in after school programs to urban middle school aged students. Implementation of the program is conducted by informing educators of the District of Columbia public schools and youth leaders on the importance of STEM; then by using resources from the UDC STEM Center, partnering with the Microsoft Store, collaborating with Operation Military Kids, and having UDC college students as mentors, the program is able to successfully work directly with schools in Wards 8, 7, 6, and 4. Those Wards identified are listed in order of having the highest poverty rates, and indeed are the most underserved population with the least amount of resources.

RESULTS: Students have a safe place to learn and be leaders, while having the opportunity to conduct hands on experiments and make observations. In pre and post evaluations students have stated that they would share their experiences with others and can relate the science projects to real life situations. The Teacher volunteers found it

comforting that the students are engaged and interested in STEM projects. In observations students while making Lava Lamps, Snap Circuits, quicksand, Dynamo Torches expressed that the project was "cool." The STEM leaders Program is rapidly expanding to schools in the District.

RECAP: Of the underserved population, 212 students and counting have completed various STEM projects in the District of Columbia by initiatives of the 4-H and the Center for Youth Development and the STEM Leaders Program.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Sustainable Energy

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
402	Engineering Systems and Equipment	50%		50%	
403	Waste Disposal, Recycling, and Reuse	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid Professional	2.0	0.0	0.6	0.0
Actual Volunteer	22.0	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
52794	0	15130	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
52794	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
66722	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This research will build a pilot waste anaerobic digester at the Agricultural Experiment Station's Research Farm in Beltsville, Maryland for the production of biomass and demonstrate that using the resources that are easily available makes the production of energy efficient and reliable. The energy producing potential of the different types of waste products will be studied through continuous monitoring of the digestion biochemical processes, operating parameters, the energy content, and the analysis of the biogas products. A Fuzzy Logic Controller of the Anaerobic Digester System will be designed in parallel with the physical digester to enable us to model mathematically or simulate certain aspects of the digester processes for increased efficiencies and process stability.

A comprehensive literature search was conducted to find the most efficient types and designs of a small AnD. The completed design splits AnD into two main parts; Mixer and Housing.

The completed pro-engineering design of the digester can be summarized as follows:

For the Mixer part, the following activities have been completed:

1. Defining the overall specification of the mixer;
2. Developing the kinematic drawing of the mixer;
3. Defining the main components such as gears, and mixing blades;
4. The design of the mixing mechanism;
5. The design of the automated feeding mechanism; and
6. A comprehensive velocity analysis for the mixing mechanism.

For the digester Housing the following activities have been completed:

1. Selection of the main elements of the Housing and the types of material needed for their construction and designing a window to monitor the level of the waste inside the tank;
2. Designing the Housing Skelton;
3. Theoretical evaluation of the fluid dynamics inside the digester tank;
4. Simulation analysis of evaluate the stresses, exerted by the waste, inside the inner tank using the finite element analysis method and approximating the geometry of the entire tank with stress elements (tetrahedrons) ;
5. Calculating the dimensions of the final metal sheets needed for the tank construction;
6. Defining the features of the tank including the types of insulation, temperature and pressure sensors needed, locations of the sensors, and the automatic feeding system.

In addition, the energy content of Bio-gas from various animals (Livestock wastes) was studied and the anticipated Gas yield compared

2. Brief description of the target audience

DC Department of the Environment
DC Department of Transportation
DC Department of Public Works
Researchers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	432	89	57	0

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

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Design of a fuzzy-logic based controller system to optimize the operation of the anaerobic digestion System in terms of operational cost, the produce energy, and the quality of the residual organic matter.

Year Actual
 2012 0

Output #2

Output Measure

- Creation of a set of fuzzy rules to control the input flow rate and to control the concentration of VFA, the concentration of chemical oxygen demand (COD), and digester operating temperatures.

Year Actual
 2012 0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Development of better designs for digestion reactor and its data acquisition sensors
2	Control of the concentration of VFA in the digester system through the manipulation of the input flow rate.

Outcome #1

1. Outcome Measures

Development of better designs for digestion reactor and its data acquisition sensors

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This research will build a pilot waste anaerobic digester at the Agricultural Experiment Station's Research Farm in Beltsville, Maryland for the production of biomass and demonstrate that using the resources that are easily available makes the production of energy efficient and reliable. The energy producing potential of the different types of waste products will be studied through continuous monitoring of the digestion biochemical processes, operating parameters, the energy content, and the analysis of the biogas products. A Fuzzy Logic Controller of the Anaerobic Digester System will be designed in parallel with the physical digester to enable us to model mathematically or simulate certain aspects of the digester processes for increased efficiencies and process stability.

What has been done

A comprehensive literature search was conducted to find the most efficient types and designs of a small AnD. The completed design splits AnD into two main parts; Mixer and Housing. In addition, the energy content of Bio-gas from various animals (Livestock wastes) was studied and the anticipated Gas yield compared.

Results

The study showed that the estimated gross energy content of approximately 30,000 Btu/head/day for dairy cow manure was two to three orders of magnitude higher than other animal waste products. The Net energy content however, will be dependent on the operating performance of the digester. Thermodynamics Analysis was done to calculate the Combustion of Methane gas and the heat exchange during the reaction. Our calculation shows that 1kg of Organic Material will produce 27.748 MJoules of heat energy. The results of the project were published in two papers presented at the 2010 ASEE conference and one paper in the 2012 ASEE Conference.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #2

1. Outcome Measures

Control of the concentration of VFA in the digester system through the manipulation of the input flow rate.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Appropriations changes
- Government Regulations

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

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
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		0%	
723	Hazards to Human Health and Safety	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.0	0.0
Actual Paid Professional	11.1	0.0	0.0	0.0
Actual Volunteer	20.0	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
70733	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
70733	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
709237	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Food Handler Certification:

- 1) Pretest
- 2) Post Test
- 3) National Examination
- 4) DC Code Examination
- 5) Ability of agencies to pass DC inspections
- 6) Measure of knowledge acquired from food handler certification messages include in the national examination
- 7) Data Collection
- 8) Data Analysis
- 9) Reporting

2. Brief description of the target audience

- Non-commercial agency staff members
- Ongoing participating food handlers
- Non-profits

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	119779	0	20749	0

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
------	-----------	----------	-------

Actual	0	0	0
---------------	---	---	---

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Classroom instruction/workshops on Food Handler Certification Regulations to include DC Code Examination or Serve Safe National Examination, and Practice Examinations

Year	Actual
2012	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percentage decrease in the risk of factors of foodborne illness.
2	Number of participants gaining awareness, knowledge and skills in Food Handling techniques.
3	Number of participants scoring a required minimum of 70% on post test and national examination.

Outcome #1

1. Outcome Measures

Percentage decrease in the risk of factors of foodborne illness.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	395

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Foodborne illness is responsible for approximately 76 million and 5,000 deaths per year in the United States. Approximately 325,000 Americans will require hospitalization yearly because of something they ate. While it is difficult to determine the total costs of foodborne illness due to many conditions such as reduced productivity, lost wages, human suffering, and medical costs that go unreported, most experts agree that the annual costs in the United States is between 10 and 83 billion dollars. The individuals most at risk of contracting a foodborne illness include the elderly, young children and pregnant women.

What has been done

A total of 79 different individuals participated in the food handler certification training classes conducted in five different sessions for a total of 20 clock hours for each session. Prior to the start of the session a pretest was administered and immediately following the session a posttest was administered. Additionally, the DC Code Examination and the National Certification exam were administered. The pretest posttest and DC Code Exam are scored by the Program Assistant using a scored key sheet and the National Certification Examination is scored by the National Program Office. All total 79 or 100% of the participants completed the training.

Results

The Food Handler Certification Program results revealed a 100 pass rate on the national examination. The mean score of 68.6% on the pretest; mean score of 91% on the posttest; mean score of 83% on the DC Code exam; and a mean score of 89% on the national exam; 100% of the participants scored the minimum of 70% on the posttest and the national exam.; 100% of the participants are now employed in the food service industry. Many of the participants were reentering residents of the District of Columbia. The number of participants is reduced during this reporting period due to budget cuts.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Number of participants gaining awareness, knowledge and skills in Food Handling techniques.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	160965

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Foodborne illness is responsible for approximately 76 million and 5,000 deaths per year in the United States. Approximately 325,000 Americans will require hospitalization yearly because of something they ate. While it is difficult to determine the total costs of foodborne illness due to many conditions such as reduced productivity, lost wages, human suffering, and medical costs that go unreported, most experts agree that the annual costs in the United States is between 10 and 83 billion dollars. The individuals most at risk of contracting a foodborne illness include the elderly, young children and pregnant women. Of the 66 individuals trained in the food handler certification program, 100% of the participants gained awareness, knowledge, and skills in food handling techniques. None or 0% of the participants' facilities reported receiving food handling violations or any illnesses associated with foodborne conditions. The number of participants is reduced during this reporting period due to budget cuts.

What has been done

Food safety and hand washing were conducted with children 2-5 years of age in child daycare, preschool, and head start programs. The nutrition educator used stuffed Elmo with the lesson to enforce the idea that "germs are bad." A story is told about Elmo going to school and forgetting to wash his hands before he eats, after using the restroom, and how his friends coughed and sneezed on him. Glitters, or "germs," are sprinkled on Elmo after each incident to show how the germs are spread. We then lay Elmo down to sleep, because he is sick. We then review how to cough, sneeze, and wash our hands correctly. Each student goes through the steps of washing their hands, using soap and warm water, to get rid of the germs. A retrospective post test was

conducted.

Results

The results revealed that 96.7% of the children washed their hands appropriately before handling food at the end of the school year as compared to the beginning of the school.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of participants scoring a required minimum of 70% on post test and national examination.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	395

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Foodborne illness is responsible for approximately 76 million and 5,000 deaths per year in the United States. Approximately 325,000 Americans will require hospitalization yearly because of something they ate. While it is difficult to determine the total costs of foodborne illness due to many conditions such as reduced productivity, lost wages, human suffering, and medical costs that go unreported, most experts agree that the annual costs in the United States is between 10 and 83 billion dollars. The individuals most at risk of contracting a foodborne illness include the elderly, young children and pregnant women.

What has been done

The DC Food Handler Certification training provides a preparatory education program for persons who are interested in becoming certified as a professional food manager. The 20-hour training identifies conditions that promote food borne illness and examines the safe and sanitary methods for handling, preparations and storage of food, both raw and cooked. Immediately following the

completion of the training the national certification and the DC Code examinations are administered. Individuals who pass the exams receive a certificate from the national office and a certificate from the Center for Nutrition, Diet and Health for the DC Code exam. A total of 18 individuals from the Regeneration House of Praise (Church in the Field) received the training. Many of the participants were returning citizens. The individuals were divided into two sessions. The first session was offered in October 2012 and the second session was in February 2013. Prior to the start of instructions a pretest was administered and immediately following the instructions a posttest was administered. Additionally, the DC Code Examination and the National Certification exam were administered. The pretest posttest and DC Code Exam are scored by the program assistant using a scored key sheet and the National Certification Examination is scored by the National Program Office. All of the participants live in Ward 8.

Results

The results showed that 100% of the participants enrolled completed the training. Additionally, 100% of the participants passed the national certification exam. The mean score on the pretest was 61%, posttest was 87%, DC Code Exam was 78%, and the national exam was 89%. The national exam scores had a high of 96% with a low of 81%. The Food Handler Certification Card is provided by the DC Department of the Environment. A comparison of the pretest and posttest group mean scores show an average gain in food handling sanitation knowledge of about 26 percentage points across all participants in the posttest over the pretest. To test this gain for statistical significance, a paired samples t-test was performed using Predictive Analytical Software (PASW/SPSS). The t-value was found to be statistically significant (p<.05), suggesting that there was a significant gain or increase in knowledge food handling as a result of the training. Similarly, a comparison of the pretest and national examination group mean scores also reveal a significant average gain of about 28 percentage points in the national exam over the pretest, and the t-value also proved to be statistically significant (p<.05) and further confirms the significant knowledge gain on the part of trainees. (Social scientists have generally accepted that if the p-value is less than 0.05 then the result is considered statistically significant. In other words, there is 95% likelihood that the mean differences between the posttest and pretest, and between the national exam and pretest, represent valid gains in scores or knowledge)

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Government Regulations

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Change in knowledge, behavior and in some instants change in condition.

Key Items of Evaluation

Retrospective Post Testa

Paired t-test using Predictive Analytical Software (PASW/SPSS).