

# 2011 University of the District of Columbia Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

The Agricultural Experiment Station (AES) and the Cooperative Extension Service (CES) are housed in the College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) at the University of the District of Columbia. A major goal for CAUSES is to develop a viable example of urban sustainability as over 50% of the world's population now live in urban centers, raising serious issues of food security, sustainable resource management, health and nutrition, and food related employment. The new college manifests the land grant model, as it seamlessly integrates academic programs with relevant research and extension/outreach, a combination which serves as a powerful resource to help District residents improve their quality of life. CAUSES provides innovative programs that prepare students to address 21st Century issues involving agriculture, nutrition and food safety, urban sustainability, urban architecture, environmental health and water resource quality and management. CAUSES strengthens the University's effort to meet the needs of local residents and provide a visionary global perspective on education for a sustainable world.

AES conducts research studies to address local and regional issues to contribute to national solutions and is currently engaged in studying problems in critical areas such as health, nutrition, sustainable energy, and sustainable agriculture. CES is providing workshops, demonstrations, training, and informative literature to residents in the areas of nutrition, youth leadership and development, financial literacy, urban gardening, Master Gardening, Water Quality, and Home Repair and Energy Conservation. Together and apart, AES and CES are providing valuable research and outreach initiatives to improve the quality of the life for the residents of our capital city.

In its recently adopted mission statement, CAUSES summarizes its long standing commitment to the land grant tradition of the University as follows: The College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) of the University of the District of Columbia offers research-based academic and community outreach programs that improve the quality of life of individuals, families, and communities in Washington DC and beyond.

This plan outlines and summarizes the accomplishments and results of research and extension programs for the District of Columbia. The joint report includes six program areas: Climate Change; Global Food Security and Hunger; Childhood Obesity; Urban Families, Youth, and Communities; and Sustainable Energy. AES and CES are not different from most units which provide public service. We have experienced a year of accomplishments yet we have met a few challenges. Regardless of obstacles or circumstances, together, these units have forged ahead with the mission of improving the quality of life for the residents of the District of Columbia.

The Merit Review Process for research continues as established. The Station's director carefully monitors the progress of each project to ensure that research objectives are being met. The Peer Review panel that reviews all research projects, policy, and best practices of research design includes representatives from various departments/schools across the University. Our reviews assess program projects and activities based on the following criteria: 1) quality; 2) feasibility; 3) scientific and technological understanding; 4) relevance; 5) familiarity with work of others; 6) student participation; 7)

inclusion of underrepresented and/or underserved populations; 8) project inputs; and 9) perceived outcomes and impacts.

The Agricultural Experiment Station is working with institutions across the country to resolve issues related to obesity and nutrition. Our two 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." Local issues being addressed, that also provide national benefit, include: health (diabetes, breast cancer, and diabetes), sustainable energy, sustainable agriculture, urban gardening, and specialty crops.

CES provided 16 informal outreach programs for DC stakeholders, conducting **10,260** workshops and **517** demonstrations across the eight wards of the city. A total of **118,222** pieces of outreach informational materials such as newsletters and fact sheets were distributed across the eight wards. Over **3,680** community volunteers supported programs that assisted in improving the quality of life of our residents. Through workshops, demonstrations and technical assistance, CES programs reached **188,143** direct contacts. All programs are designed to increase knowledge, change behavior and ultimately change social, economic and environmental health conditions.

We have conducted Stakeholder Listening Sessions in communities in the District of Columbia. Our current focus is on the underserved populations of Wards 7 and 8. 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. Data collected from residents indicates that residents are concerned about issues related to health; healthy activities for youth; urban gardening; healthy food choices and preparation; and community resources and economic development. Residents are equally interested in matters related to food safety; childhood obesity; and sustainable energy. AES and CES are currently conducting research and providing outreach services in several of the aforementioned areas. However, we will consider expanding our research program and extension activities to address issues related to environmental quality and food safety.

Activities during this reporting period for research and extension for each planned program are outlined below.

### **Climate Change**

Currently, the Agricultural Experiment Station is not conducting research under this program. The Cooperative Extension Service is providing workshops, demonstrations, and literature in support of this program in the areas of water quality education and urban forestry.

The CES Water Quality Education program of the Center for Sustainability provides education on water quality standard, rain gardens, and green roofs. Also, the program provides hands-on experience on managing rain gardens installed on school premises as well as testing water quality parameters with students in schools to enhance hands-on experience. K-12 water quality curriculum has been placed in some area schools. Knowledge on climate change, water quality, health, water economy, conservation, irrigation, E-coli contamination, water and food safety, including how to read water bills was provided through fact sheets, workshops, brochures, models and demonstrations. K-12 curriculum was completed with collaborated Universities. A poster on water quality was presented at the National Water Program Conference. 1,914 factsheets and promotional materials were distributed. 632 youth completed lesson plans prepared for water quality education workshops and 285 adults completed lesson plans prepared on their level for water quality education workshops. Pre and Posts tests indicated increased knowledge in water quality issues. As a result of this new education, residents have requested to have their water tested.

Invasive, non-native plant species are a problem of increasing concern in the District of Columbia as their presence has 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. Outreach is the first line of defense and invaluable for early detection rapid response.

The UDC Cooperative Extension Service is participating in a Cooperative Weed Management Area. The project is a collaboration of federal, state, and city level governmental agencies and local non-profits in the Washington Metropolitan Area working together across organizational boundaries to 1) more effectively address the invasive species problem; and 2) strengthen and increase the breadth of local invasive species programs. Information was disseminated through workshops, invasive species identification walks, invasive species abatement training work days, and also via phone, email and in person consultations. Information about upcoming events was disseminated through the organization for which the events were coordinated.

The DC Cooperative Extension Service offered eight invasive species events to the public. Events provided invasive species education and outreach through workshops, invasive species identification walks, and invasive species abatement training during workdays. The workshops familiarized attendees with the concept of invasive species, the criteria that qualifies a species as invasive, the way in which species spread, their ecological impact, and an introduction to specific invasive species. The invasive species highlighted were primarily invasive plants that are problematic in the District, but several invasive insects and pathogens, such as Sudden Oak Death and Emerald Ash Borer, were also covered. Additional information and recommendations for invasive species identification and removal were also provided to District residents via email, phone, or face to face consultations, and also through site visits. Target audiences were District residents, land owners in the District, green job trainees, and volunteer groups that provide education and public outreach.

### **Global Food Security and Hunger**

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. According to the USDA's 2009 report, Household Food Security in the United States, between 2007 and 2009, an average of over 76,000 households lacked food security.

District residents can improve their diets and health by raising their own vegetables. 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 Urban Gardening and Ethnic Crops programs set up rotating demonstration garden plots across the city to demonstrate to residents that they too can grow their own food, in addition to supporting other gardeners and gardens in the city with technical support. The gardens also provide an opportunity to interface with residents and increase

visibility for the University.

Seven demonstration gardens were installed and or maintained throughout the city at various District Parks and Recreation sites and community gardens. Two of the demonstration gardens in place from the previous year were able to double their size. Technical support and resources were also shared with other gardens in the city such as Martha's Table, Common Good City Farm, and a newly installed raised bed garden for the senior residents of Sibley Plaza. The food that is raised in the plots is available for the community to harvest, which is a real crowd pleaser. The gardens feature traditional vegetable varieties as well as ethnic crops. Seventeen types of edible produce was planted in these gardens, showcasing 27 varieties. Conventional vegetables included: collards, kale, lettuce, cabbage, spinach, turnips and radish. Ethnic vegetables included: Celosia, Gboma, Garden Eggs, Hibiscus, Purslane, Huckleberry, Hot Peppers and Jute Leaves. The Hibiscus remains the most popular plant, as the public immediately appreciated it, after a first taste of the leaves.

Technical assistance was provided through site visits and email/phone consultations and covered topics from fertilizing to pest identification/control and plant sampling for pathogen diagnosis to soil sampling. During the program year, we have provided 202 outreach demonstrations and have had direct contact with 352 youth and 686 adults in District communities.

We reached out to the immigrant communities of the District and beyond to announce the availability of their "home foods" which they may be able to get from area small farmers and their ethnic food outlets. As we taught the growing techniques of these crops, some immigrants may grow these foods by themselves. At this juncture, established and new food entrepreneurs are also learning about the new food system and the value chain therein. In addition to gardening techniques, CAUSES extension staff also provided educational programs to participants in entrepreneurship workshops on food production related business opportunities.

DC Department of Parks and Recreation site managers, Louis P. Jones and Juanita Peterson, wrote the following comments in a letter, commending extension agents for their community efforts:

"We at Theodore R. Hagans Cultural Center (Senior Services Division of DC Parks and Recreation) along with the participating community have immensely enjoyed participation in the Spring, Summer and Fall Garden Projects in collaborative partnership with UDC and its instructors, Yao Afantchao and Mary Farrah.

Mr. Afantchao and Ms. Farrah worked laboriously in the creation of another successful gardening venture. The various ethnic vegetables continue to attract the attention of the residents of our community who became knowledgeable of the garden and enjoyed its harvest. The second year was more successful, as we have observed visitors of diverse ethnicity, gender, race and age participate in our garden project here at Theodore Hagans. By our estimation, we are able to report that about two hundred (200) people have viewed the demonstration garden and inquired about gardening services for themselves/families..."

The Agricultural Experiment Station provides support to the Food Security and Hunger Program via a Sustainable Agriculture Research and Education (SARE) grant. The focus of this grant is establishing urban gardens in the District of Columbia by using sustainable techniques. The SARE Program has established a permanent garden at the University Farm in Beltsville, Maryland where sustainable agriculture techniques are used to grow vegetables. Such techniques include the following: 1) Using composted organic waste such as cow manure as soil amendments to grow plants rather than inorganic fertilizers which end up not only as a soil nutrient but also as an environmental pollutant; 2) Cultural practices such as intercropping, resistant varieties and mechanical insect control instead of using toxic chemicals. Also, mechanical weed control instead of toxic chemicals to control weeds; and 3) In addition to training gardeners by visiting them on site, our training program includes hands-on training at the farm.

The gardeners receive the hands-on training at field days and workshops, seminars and the development of fact sheets (INFO DOCS).

We now have 250 active master gardeners in the District of Columbia. Of these gardeners, 75% (approximately 187) are using sustainable agricultural techniques such as composted material as a soil amendment, organic pest control and intercropping as their crop production system. In addition to the Project Director and the Associate Director, three extension agents are now helping gardeners to use sustainable agricultural techniques in their garden plot projects. Unfortunately, we have not yet been able to achieve our goal of making soil testing available to each gardener. However, through our training program we have been able to make them become aware of the importance of soil testing in maintaining and enhancing soil fertility. Additionally, the University has just completed the construction (opening scheduled for May 3, 2012) of a new state of the art laboratory which will be used for some soil testing beginning in June 2012.

We have tested a solar pod production of vegetables which is capable of extending the growing season to the latter part of December in the District of Columbia. Through two field days, we have introduced 100 gardeners and students to the techniques used to grow crops in these solar pods. We have also introduced outdoor mushroom production in our gardening training. Approximately 10 extension agents and 150 gardeners have been given instruction on how to grow mushrooms on logs outdoors.

The DC Master Gardener Program was started as a means of extending the horticultural and pest management expertise of the University's Extension Service to the general public. The program is designed to train volunteer horticultural educators. 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, 226 (which includes 45 trainees) Master Gardeners and Trainees provided 8,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$33.61 per hour according to [www.independentsector.org](http://www.independentsector.org) with a total value of **\$268,880** 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 work. 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 fields and obtain employment.
- 500 pounds of produce was donated to soup kitchens.
- 500 hours of volunteer work helped revitalize a ¼ acre vacant lot and turned it into an urban farm at Walker Jones Educational Campus
  - 100 Raised Beds at Schools were installed, planted and maintained and used for educational purposes.
  - 3,000 spring flowering bulbs were planted at 35 sites across the city.
  - ½ of Master Gardeners use sustainable horticultural practices
  - 25 Master Gardeners saved on their grocery bills by growing their own vegetable

### **Childhood Obesity**

Research indicates that obese and overweight children tend to retain these conditions as adults. Obesity is one of the leading causes of chronic illnesses and conditions, i.e. hypertension,

hypercholesterolemia, diabetes, cancer, and heart disease. AES and CES are working to address the critical issue of obesity through research studies and outreach services as outlined below.

### **An Integrated Approach to Prevention of Obesity in High Risk Families**

The Agricultural Experiment Station continues work on a multi-state research project focused on obesity in high risk families. In this period, we continued to develop our software system, MyHealth Journal, on mobile computing platforms: iPhone and iPad, for obesity data collection. To further leverage the strength of mobile computing, we investigated wireless sensing data collection for MyHealth Journal. The plan is to use remote sensor that is attached to human body, to collect bio signals which can be transmitted back to iPhone or iPad and be recorded by MyHealth journal automatically. Two students were recruited and trained by the PI. Under the PI's direction, they conducted research on the capability of wireless signal transmission and collection of iPhone and iPad during summer 2011. A technical report is written on the findings. The PI made a presentation at AES Research Seminar at UDC (University of the District of Columbia) in October, 2011. This seminar was open to the public. Two undergraduate students were trained on mobile computing, information security and research.

The software system we developed for both personal computer and mobile devices such as 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 Modifications**

AES continued its participation in a multi-state research project designed to change the health trajectory for older adults through effective diet and activity modifications. The major goal of the project is to design and implement intervention strategies that will increase fruit, vegetable, and whole grain consumption in multicultural elderly individuals in the District of Columbia who have been identified as low consumers of these foods. These interventions will be designed as a result of data collected using a survey instrument that has been constructed to compare knowledge, priorities, and attitudes of high fruit, vegetable, and whole grain consumers with low fruit, vegetable, and whole grain consumers. We will compare the cognitive and affective characteristics of these two groups in order to assess their effect on food choices and consumption as well as determine the extent to which elderly citizens provide nutritional care to children. (The assumption is that interventions with child caregivers will positively affect the children in their care.) Also, we will publish a recipe book with original and modified recipes that incorporate memories and traditions from the elderly and record critical and significant endeavors of their lives. Further, we will network with community leaders to organize favorite food demonstrations from seniors.

During the period, a survey was designed and completed, field tested, and validated. Four day food diaries from participants were used to validate survey responses to assess the portions of fruits, vegetables, and whole grains. Cameras were provided for participants as an incentive to participate in the study. The registered participants were from congregate sites in the District of Columbia operated through the assistance of the Office on Aging. Research data was collected by: 1) reviewing Survey Questions; 2) recruiting subjects; 3) conducting interviews; 4) delivering cameras; 5) collecting 4 Day Food Logs; 6) collecting camera memory chips; 7) reviewing completed surveys; and 8) analyzing surveys & Food Logs.

Interventions will be designed as a result of data collected using a survey instrument that has been constructed to compare knowledge, priorities, and attitudes of high fruit, vegetable, and whole grain consumers with low fruit, vegetable, and whole grain consumers. We will compare the cognitive and affective characteristics of these two groups in order to assess their effect on food choices and consumption as well as determine the extent to which elderly citizens provide nutritional care to children. (The assumption is that interventions with child caregivers will positively affect the children in their care.) Also, a recipe book will be published with original and modified recipes that incorporate memories and traditions from the elderly and record critical and significant endeavors of their lives. Further, we will network with community leaders to organize favorite food demonstrations from seniors.

### **CES Center for Nutrition, Diet, and Health (CNDH)**

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 is limited in low-income neighborhoods. Therefore, daycare or school settings are often the only locations to reach these children and implement nutrition and physical activity into the curriculum.

The Family and Consumer Sciences and Center for Nutrition, Diet and Health programs and activities are clustered under this planned program area. The Center's programs include:

- Supplemental Nutrition Assistance Program- Education (SNAP-Ed)
- Expanded Food and Nutrition Education Program (EFNEP)
- Food Handler Training and Certification Program
- Food Safety Education

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

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.

SNAP-Ed conducted 10, 957 workshops/ demonstrations at 124 sites in all eight (8) Wards in the District of Columbia including workshops/demonstrations as follows: 1,604 in Ward 1; 425 in Ward 2; 105 in Ward 3; 3,600 in Ward 4; 636 in Ward 5; 939 in Ward 6; 813 in Ward 7, and 1,939 in Ward 8. Additionally, 315 individuals completed certificate programs. A total of 155, 568 contacts with the assistance of 467 extension-trained teachers, 15 volunteers, and facilitators in senior programs were generated. The 155, 568 contacts by Ward were as follows: 21,178 in Ward 1; 7,238 in Ward 2; 2015 in Ward 3; 55,422 in Ward 4; 9,088 in Ward 5; 11,932 in Ward 6; 17,113 in Ward 7; and 31,582 in Ward 8.

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 follow:

Juanita E. Thornton, Early Child Development Center #8 writes, "... since Ms. Swanson, nutrition educator has been visiting my classroom for the last year and half, I have noticed how the children are at least willing to try the different foods she has been bringing in. As I share with the parents on our nutritional Wednesdays the importance of eating healthy and exercising, the feedback from the parents is great. Some parents have shared that by eating the rights foods (fruits, vegetables, and protein), their child's behavior has calmed down, waking up from bedtime has improved, and they are retaining information effectively. I too think the newsletters that she sends home, helps the parents with planning meals and healthy snacks to eat at home. Of course here at school, the menus are appropriate for the different age levels that we serve. I have noticed a change in the behavior of the children and how they are staying more focused on directions from the teachers. Both the parents and I are extremely pleased to learn different ways to prepare veggie pizza with a whole wheat English muffin and fat-free cream cheese, fruit "ice cream" cones from fat-free yogurt, and tasting different textures of fruits and vegetables. Cutting out the sugar and incorporating a different fruit in place of it is AWESOME!"

Katrina Jackson, Preschool/Head Start Teacher, Neval Thomas Elementary School, 650 Anacostia Avenue, NE writes, "I have a combination of three and four year old children. I keep some of my children for 2 years, so half of my class has had the opportunity of 2 years working with Ms. Katey Swanson, nutrition educator. Most of my children are able to identify familiar and unfamiliar fruits and vegetables. They are able to use their sorting and classification skills when identifying the food and putting the foods into their correct food group. Some parents have noticed their children choosing the healthier snacks instead of the junk foods when shopping for groceries. Their vocabulary skills are strengthened as they discuss the different foods, food origins, colors, etc. The children can now explain why we should eat healthy foods and how the healthy foods affect the body. Other health tips such as hand washing and the importance of hand washing, hygiene, and germs are discussed as well. This helps the children become aware of how germs are spread and how one should conduct themselves when sneezing or coughing."

Christine Rey, Prekindergarten/Head Start Teacher, Garfield Elementary School, 2435 Alabama Avenue, SE, writes, "Since working with you and the SNAP-Ed nutrition program, I've noticed a drastic change in the children's understanding of healthy foods and other healthy activities (hand washing, exercise, etc.) My children are much more aware of where food comes from; the differences between fruits and vegetables; and healthy vs. unhealthy foods. I've even heard children correctly categorize foods as "dairy" or "produce." I know that this knowledge is from the SNAP-Ed program. I've also noticed an increase in awareness of the importance of exercise. The children listen to their hearts and can tell when their bodies are moving fast or slow. But, perhaps most importantly, I've been amazed to see how excited the children are to try new foods. My children are now eating (and enjoying!) new fruits and vegetables and whole grains. The children are more conscious of what they're eating and are more willing to try new foods. Not only are the children trying these new foods at school but they are talking about these new foods at home and in some cases asking their families to try/buy them too! SNAP-Ed is an effective-and essential- program that has taught my children how to make healthy choices, which will set them on the right path for a healthy life! Thank you so much for everything that you do for my children and families. You are greatly appreciated!"

Other research associated with this program follows:

### **Developing Fuzzy-set-theory-based Data Mining Methodologies for Diabetes Data Analysis**

AES is conducting research to develop an innovative and advanced method for finding the diabetes associated genes using gene expression data. Gene expression data is often uncertain, e.g.



accompanied by noise that can affect the analysis of gene expression and its associations with biological functions. It can also be incomplete, e.g. with data items missing. Thus, we are developing fuzzy-set-theory based approaches for diabetes data analysis. During the past three years, we had made two new additions to our X-test family, a series of fuzzy-set-theory-based data mining approaches. They have both been proved to be effective in diabetes gene microarray data difference analysis. We have achieved with presentations and publications at international prestigious conferences and in peer reviewed journals. A manuscript has been published. To the best of our knowledge, we are the first to develop gene microarray data analysis on a cloud computing platform. FM-PGA has achieved very promising performance both in terms of time and classification accuracy. In the second half of 2011, to further take advantage of the parallel processing power of cloud computing for diabetes microarray data analysis, we conducted research on Genetic-algorithm-based gene pathway analysis on cloud-computing platform. We also submitted a renewal proposal for to continue this development. The proposal has been approved.

Our research team includes four professors from three different universities and three disciplines. The universities include UDC, University of Maryland and Tuskegee University. The disciplines include computer science, biology and electrical engineering. The UDC AES team joined SURA (Southern University Research Association) to share this cluster as computing resource with other institutions in the association. This project is successful in terms of methodology development, publication, collaboration, and student involvement.

### **Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer**

The National Cancer Institute indicates that obesity increases the risk of cancers of the breast (postmenopausal). AES is conducting a study that involves nutrient modulation of P53-ATF3 signaling in breast cancer to investigate the molecular mechanism whereby g-T3 inhibits the growth of breast cancer cells. 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 this project is to understand the molecular basis of the action of gamma-T3.

The project made significant progress in the last year. 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 have 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 is submitted for publication demonstrating autophagic involvement of tocotrienols in human breast cancer cells.

### **Sustainable Energy**

#### **The Design and Development of an Experimental Anaerobic Digester for Organic Waste**

The major accomplishments in this reporting period include: a) a feasibility of the design and implementation of an operational digester, the monitoring and control of the different biodegradation process variables and experiments to boost or maximize the gas production was conducted; and b) The

design and evaluation of a lab-scale anaerobic digester.

The goal of the feasibility study was to get an understanding on the characteristics of organic waste from hotels and restaurants and study the feasibility of implementing the proposed anaerobic digester for biogas production for District of Columbia hotels and restaurants. The specific research objectives of the study include a) Understanding of organic waste collection methods in hotels and restaurants; and b) Possible quantification of organic waste. The feasibility study research methodologies include: a) Preparation of survey questioner to collect the data about the current generation and waste processing of organic waste from a variety of sources; b) Implementation of survey through site visits; and c) Quantification of daily organic waste and evaluation of waste processing through the experimental anaerobic digester.

The goal for designing a lab-scale anaerobic digester was to build a mini anaerobic digester that can generate biogas in the laboratory and to provide preliminary data and identify key aspects of the design for an efficient, reliable, and low-cost anaerobic digester for waste processing. The specific research objectives the lab-scale digester include: a) The design of a small scale anaerobic digester that can be operated with a minimum of monitoring; b) Regulating, and adjusting and optimization of the experimental condition to maximize the amount of biogas produced per unit time with the proposed mini digester. The research methodologies for the small-scale anaerobic digester include: a) Design and fabrication of laboratory scale mini anaerobic digester; b) Analysis of the content of the biogas produced by the proposed mini digester using Gas.

Biogas was produced when cow manures with different solid content were used. Some preliminary conclusions were summarized: Low cost and low maintenance mini Anaerobic digesters were successfully built and used to produce biogas from raw manure and liquid manure. For all biogas samples produced by the mini digester, methane content ranges from 46.9 percent to 64.6 percent. Preliminary data shows that raw manures are better source for the mini digester to produce biogas than liquid manure (produce biogas faster with more methane content).

## **Urban Families, Youth, and Communities**

### **4H and Youth Development**

The CES 4-H and the Center for Youth development program saw a year of progress and change in fiscal year 2011. The year began as did the previous year with a team of eight full time program staff members implementing programs. Four members of our team were working from grant funds and four from the Extension Service dollars. With this highly effective team we were able to establish new clubs and maintain activities for a total of 42 4-H clubs in the District of Columbia with approximately 220 children being served weekly through regular club activities. In this program year, 34,000 direct contacts were made with youth in the District of Columbia through programs and clubs. We presented the Annual Operation Military Kids Overnight Summer Camping Program at the Skycroft Conference Center in Middletown, Maryland in August hosting 40 youth from the military with our military partners.

Some highlights include the following:

- Three teams participated in the LifeSmarts competition, with the six member team from Ideal Public Charter traveling to Los Angeles, California to compete in the National Competition. Six teams are registered to participate in District of Columbia LifeSmarts competitions this year. More than 90 teens from the District of Columbia, Virginia and Maryland attended a pre-competition training this year to prepare for the state competition.
- Washington D.C. Operation Military Kids participated in 5 Military Family Fun Day events. Through fun and engaging activities, youth and adults were able to hone life skills, as well as enjoy a fun-filled time with

their, friends and families. Through deployment activities, participants gained skills in Resil-iency, Communication, Sharing, Coping with Stress, Nurturing Relationships, Decision Making, Critical thinking, and a host of other critical life skills. Family Fun Days were held twice at Ft. Belvoir, twice at Bolling Air Force Base, and once at Walter Reed. In all, these events served more than 300 military youth participants, and nearly 400 adult military participants.

- This year we took 44 Operation Military Kids (OMK) youth to the Skycroft Conference Center in Middleton, Maryland for the week long overnight camping experience. With a beautiful mountainous views, and stunning landscapes, Skycroft Conference Center provided the perfect setting for both an educational and fitness driven camp experience. We hosted youth from different military branches, and provided a fun and friendly camp experience for all. The 4-H Operation Military kids back-to-school jamboree is an event held for military youth right before the school year begins. It serves as a fun closing to the summer, and as one last big social gathering for military youth to mingle before the return to their respec-tive schools. This year, we held our Jamboree in Wheaton, MD the location of our Walter Reed medical Center partners. The event was open to all branches f the military, there were over 150 participants from the National Guard, Army Reserve, and Air Force and Walter Reed Medical Center families. We closed the day with a Bar-B-Que, and a dance for the youth.

- Fifteen 4-H clubs in our Latino community were operating in Wards 1, 2 3, and 4 of the city. Activities included photography, cooking, sewing, arts and crafts and soccer. There was and continues to be a special nutrition club for pregnant teens that host 30 youth per sessions. Partnering with the Center for nutrition Diet and Health teen learned about healthy alternatives for themselves and their children. These 4-H activities are integrated to serve the Hispanic community where many of the parents do not have English as the first language. A volunteer's leaders program was presented in their native tongue here at UDC and the parent's participation in our 4-H programming has been exceptional. The Photography club youth are participating in the National Archives Photography competition.

### **Financial Literacy**

The CES Center for Sustainability's Basic Financial Planning Program delivers consumer/research-based financial education to the Washington, DC public through, workshops and mass media, often in partnership with community groups, volunteers and professionals located in the city of Washington, DC. The Center for Sustainability/Basic Financial Planning Program services about 1,000 Washington, DC residents yearly and offers education about Basic financial management; Credit and predatory lending; Saving and investing; Identity theft and consumer fraud; and Estate planning and insurance. Sixty-six workshops in basic financial planning were conducted for a total of 967 individuals. When surveyed, 86% of participants indicated that they would begin to write a budget and increase their savings and investments. The lead extension agent for financial literacy recalls this success story:

- On April 20, 2011, Michael Johnson gave me a call to say that he started a new job at Metro Teen AIDS as an Outreach Specialist and he opened a savings and checking account with PNC Bank. Mr. Johnson also told me that he is participating in his company's 503-B plan and also opened a Roth IRA account. He said he was thankful for participating in my Basic Financial Planning Workshop.

### **Housing**

The CES Housing Cooperatives program, in conjunction with the local and national cooperative support network, is an interdisciplinary research, education and community service system for the study of cooperatives through cooperative education and training. The program assists DC residents and small metropolitan area farmers. In the midst of a growing concern regarding a market access to fresh and healthy food choices, the city's public University and America's land grant institution has established a program to connect farmers with residents in the urban environment. Working in partnership with the Mid-Atlantic Growers and Consumers Cooperative supported by the DC Market Maker Technology, UDC Farmer's Market presents a broad selection of fresh food to cultivate a healthier, more connected community focused on the reduction of obesity, diabetes and hypertension.

The objectives of the program are to: 1) Improve the lives of DC Residents through cooperative education, business development and access to fresh fruits and vegetables; 2) Create a dual-pronged, interactive and mutually sustainable collaboration between the small, rural agriculture producer and the urban food consumer; 3) Provide greater access to fresh fruits and vegetables; 4) Provide education and training materials regarding healthy eating practices; 5) Provide access to profitable markets for Mid-Atlantic minority farmers; 6) Provide incubation small business job development programs for minority farmers/vendors in the Mid-Atlantic Region to help assure small farm/small business sustainability; 7) Establish a food marketing cooperative which integrates DC Market Maker Technology with the Center for Cooperatives; and 8) Hold strategic symposia on current subjects which impact cooperatives in the District of Columbia; 9) Provide technical and educational assistance to local cooperatives (dissemination of program publication, focus groups, workshops, symposia, legal counseling from the University's David A. Clark School of Law, MarketMaker training, and hands-on training and practicum at the UDC Farmers' Market).

Under the leadership of President Allen L. Sessoms, the University is currently undergoing changes in administration and infrastructure, all aimed at increasing our efficiency and effectiveness as we serve the residents of our nation's capital. AES and CES are making efforts to plan purposefully, execute effectively, and to employ continuous improvement strategies to ensure that we meet the needs of our stakeholders.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	31.8	0.0	4.5	0.0
Actual	52.9	0.0	9.0	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**

The Merit Review Process for research continues as established by the Station's Director. This process ensures that research proposals are judged in a fair and indepth manner to ensure quality, relevance, and impact. For Hatch and Mini-grants offered through the Station, the process includes: Development of 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 Reviews assess 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 both the AES Director and Associate director to ensure that project objectives and timelines are being met. An annual progress report is required and is reviewed by the Director prior to electronic submission to USDA. All research projects must include student learning experiences. All researchers are required to participate in the Annual AES Research Seminar to discuss their research, findings, and benefits to the residents of the District of Columbia. The 2011 Research Seminar was held in September 2011 at the University of the District of Columbia. 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 the Annual Research Seminar.

### **III. Stakeholder Input**

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

- 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.**

During 2011, an outreach program coordinator was hired to assist with planning and coordinating Community Listening Sessions for AES and CES. 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 coordinator has contacted and 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 that emphasized 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 and things 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.**

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.**

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

The residents appreciate having a voice and they use it!

IV. Expenditure Summary

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
1157560	0	887783	0

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	947576	0	649300	0
<b>Actual Matching</b>	947576	0	647871	0
<b>Actual All Other</b>	1481955	0	15000	0
<b>Total Actual Expended</b>	3377107	0	1312171	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	76070	0	175101	0



**V. Planned Program Table of Content**

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

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

**Program # 1**

**1. Name of the Planned Program**

Climate Change

**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%		0%	
111	Conservation and Efficient Use of Water	20%		0%	
112	Watershed Protection and Management	20%		0%	
124	Urban Forestry	25%		0%	
141	Air Resource Protection and Management	5%		0%	
806	Youth Development	10%		0%	
	<b>Total</b>	100%		0%	

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

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

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	7.2	0.0	1.5	0.0
Actual Paid Professional	2.1	0.0	0.0	0.0
Actual Volunteer	18.0	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
92150	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
92150	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
67112	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
2. Provided workshops, demonstrations and technical assistance on water quality education
3. Invasive species removal from parkland in the District of Columbia

**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**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	1350	0	31	0

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

**Patent Applications Submitted**

Year: 2011

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
<b>Actual</b>	0	0	0

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

## **Output Target**

### **Output #1**

#### **Output Measure**

- Number of articles published

<b>Year</b>	<b>Actual</b>
2011	2

### **Output #2**

#### **Output Measure**

- Number of fact sheets published

<b>Year</b>	<b>Actual</b>
2011	6

### **Output #3**

#### **Output Measure**

- Number of newsletter published

<b>Year</b>	<b>Actual</b>
2011	0

### **Output #4**

#### **Output Measure**

- Number of workshops, demonstrations and technical assistance implemented.

<b>Year</b>	<b>Actual</b>
2011	204

### **Output #5**

#### **Output Measure**

- Number of research projects completed  
Not reporting on this Output for this Annual Report

### **Output #6**

#### **Output Measure**

- Number of soil, air and water samples test results  
Not reporting on this Output for this Annual Report

**Output #7**

**Output Measure**

- Number of informational materials distributed

<b>Year</b>	<b>Actual</b>
2011	22414

**Output #8**

**Output Measure**

- Number of conference presentations

<b>Year</b>	<b>Actual</b>
2011	2

**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.
4	Transfer of new knowledge to DC consumers to increase awareness and understanding of water quality issues, thereby leading them to safeguard actions to ensure they are drinking clean, safe water.

**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
2011	98

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

**Issue (Who cares and Why)**

Invasive, non-native plant species are a problem of increasing concern in the District of Columbia as their presence has 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.

**What has been done**

The DC Cooperative Extension Service offered eight events to the public. Events provided invasive species education and outreach through workshops, invasive species identification walks, and invasive species abatement training during workdays. Additional information and recommendations for invasive species identification and removal were also provided to District residents via email, phone, or face to face consultations, and also through site visits. A booklet of invasive plant species prevalent in the District was published and sent to 20,500 homeowners throughout the District of Columbia in a direct mailing campaign.

**Results**

The events provided information about 24 invasive species to 204 people. Eighty-two (82) of the workshop attendees completed a survey. Of the 82 people surveyed, 27% learned about invasive species for the first time; 78% reported learning about one or more invasive species of which they were previously unaware; and 83% percent learned that a species they were already familiar with was actually an invasive species. 98% of people felt they had a better understanding of invasive species as a result of the class. 99% reported they were going to share their knowledge of invasive species with others. Changes in action are imminent as 98% of

participants said they would not intentionally install invasive species into their landscapes, and 90% wanted to participate in invasive plant species abatement events.

#### 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
2011	30

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

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

If left unchecked, invasive species 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. Outreach is the first line of defense and invaluable for early detection rapid response.

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

The UDC Cooperative Extension Service is participating in a Cooperative Weed Management



Area, which is currently a collaboration of federal, state, and city level governmental agencies and local non profits in the Washington Metropolitan Area working together across organizational boundaries to more effectively address the invasive species problem, and to strengthen and increase the breadth of local invasive species programs.

### **Results**

At least nine invasive plant species were mitigated on approximately 8.75 acres of land in Rock Creek Park and on the UDC Campus. There were 61 volunteers working at three abatement events, accumulating a total of 671 volunteer hours. The removal of invasive species not only contributed to the efforts addressing the invasive species problem in the District but saved the city in labor costs associated with this work. According to independentsector.org, the monetary value of volunteer hours is valued at 33.61 USD in Washington, DC, an aggregate savings of 22,552.31 USD for the city.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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

### **Outcome #4**

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

Transfer of new knowledge to DC consumers to increase awareness and understanding of water quality issues, thereby leading them to safeguard actions to ensure they are drinking clean, safe water.

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

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	228

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

**Issue (Who cares and Why)**

Clean, safe drinking water is a basic need for all humans. NRDC (Natural Resources Defense Council), one of the nation's most powerful environmental groups, advises, "We often take the purity of our tap water for granted -- and we shouldn't." NRDC's What's on Tap?, a carefully researched, documented and peer-reviewed study of the drinking water systems of 19 U.S. cities, found that pollution and deteriorating, out-of-date plumbing are sometimes delivering drinking water that might pose health risks to some residents. An informed, involved citizenry is essential to ensure that the water being consumed is of good quality and thus, safe to drink.

**What has been done**

The DC Cooperative Extension Service's Water Quality Program conducted 37 workshops and 17 presentations in an effort to educate the citizenry about safe drinking water, minimizing/eliminating pollution from entering water resources, and conservation of water resources. More than 1,900 fact sheet were distributed containing valuable information on water quality and safe drinking water.

**Results**

A total of 917 residents gained knowledge and a keener understanding of water quality issues, especially those pertaining to safe drinking water. 632 youth and 285 adults participated in the program. Of the adults surveyed, 80% or 228 indicated that they will have their water tested. New knowledge has changed their attitudes and eliminated the assumption that all tap water is safe. These residents are now moved to action, taking steps to ensure that the water they consume is clean and safe for themselves and their families.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
806	Youth Development

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

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

- Other (administrative - facilities)

### **Brief Explanation**

The laboratory which will enable us to perform soil, air, and water samples at the University is near completion. We expect that the laboratory will be fully operational in Spring 2012.

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

### **Evaluation Results**

Most of the program objectives were met. Over two hundred workshops were held for residents on topics ranging from water quality issues to invasive species and environmental stewardship. Residents' new found knowledge changed their attitudes about environmental concerns related to pollution and habitat degradation. Over 8 acres of invasive species were removed from District parklands by community volunteers, saving the city an estimated \$22,000 in labor costs. Due to circumstances beyond our control, we were not able to conduct soil, air, and water testing. The laboratory was under construction during the reporting period; however, it is now completed and scheduled for opening in May 2012. We will now use the laboratory to perform soil testing. A research project was not conducted during the reporting period. Under the leadership of a new College Dean, Dr. Sabine O'Hara, who also serves as the Director for AES and CES, it is expected that this program and all other research and extension programs will expand in the coming year.

### **Key Items of Evaluation**

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

**Program # 2**

**1. Name of the Planned Program**

Global Food Security and Hunger

**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%		35%	
205	Plant Management Systems	35%		35%	
216	Integrated Pest Management Systems	10%		10%	
721	Insects and Other Pests Affecting Humans	10%		10%	
806	Youth Development	10%		10%	
	<b>Total</b>	100%		100%	

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

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	2.0	0.0
Actual Paid Professional	4.2	0.0	5.5	0.0
Actual Volunteer	3355.0	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
161198	0	127241	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
161198	0	218492	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4898	0	15000	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; their impact on the environment will be conducted 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 distributed 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; and

5) Maintained Master Gardening certification; trained gardeners will participate in beautifying the city through volunteer hours.

6) Installed urban community gardens and assisted with established gardens in the District of Columbia.

**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**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	14964	2564272	2942	0

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

**Patent Applications Submitted**

Year: 2011

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
Actual	0	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- Number of articles published

Year	Actual
2011	0

**Output #2**

**Output Measure**

- Number of fact sheets published

Year	Actual
2011	2

**Output #3**

**Output Measure**

- Number of Newsletters published

Year	Actual
2011	0

**Output #4**

**Output Measure**

- Number of workshops, demonstrations and technical assistance implemented.

Year	Actual
2011	138

**Output #5**

**Output Measure**

- Number of research projects completed

<b>Year</b>	<b>Actual</b>
2011	1

**Output #6**

**Output Measure**

- Number of soil, plant and water samples test results  
Not reporting on this Output for this Annual Report

**Output #7**

**Output Measure**

- Number of informational materials distributed

<b>Year</b>	<b>Actual</b>
2011	500

**Output #8**

**Output Measure**

- Number of conference presentations  
Not reporting on this Output for this Annual Report

**Output #9**

**Output Measure**

- Number of demonstration gardens installed throughout the District of Columbia at Community Gardens and Recreation Centers

<b>Year</b>	<b>Actual</b>
2011	7

**Output #10**

**Output Measure**

- Number of ethnic varieties introduced to urban garden demonstration sites in the District of Columbia.

<b>Year</b>	<b>Actual</b>
2011	8

**Output #11**

**Output Measure**

- Number of participants passing the Master Gardeners examination as required for certification.

<b>Year</b>	<b>Actual</b>
2011	45

**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	Percentage of workshop and training participants who pass required exam(s) and obtain certification as a Pesticide applicator
4	Percent of soil, plant and water sample results within acceptable crop production range
5	Promote a variety of traditional and ethnic varieties for urban gardeners in the District of Columbia to grow and include in their diets.
6	Trained Master Gardeners will assist with city horticultural and revitalization initiatives, providing healthy foods for vulnerable populations 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**

<b>Year</b>	<b>Actual</b>
2011	75

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

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

In the District of Columbia, particularly in the poorest neighborhoods, our citizens are having difficulty in obtaining fresh vegetables for their diets. They try to alleviate this problem by endeavoring to produce the needed fresh vegetables in their gardens. The drawback here is that they often resort to conventional agriculture which encourages them to use cultural practices that require the use of inorganic fertilizers and toxic chemicals to control plant pests. These chemicals in addition to acting as soil amendments and control of plant diseases and insects also pollute our environment.

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

Through the Sustainable Agriculture Research and Education program we taught gardeners an alternative way to produce fresh vegetables in their gardens without using chemicals that will pollute their environment. Techniques taught include: intercropping, composting (organic waste such as cow manure), and instructions on field plot preparation.

#### **Results**

We now have 250 active master gardeners in the District of Columbia. Of these gardeners, 75% (approximately 187) are using sustainable agricultural techniques such as composted material as a soil amendment, organic pest control and intercropping as their crop production system.

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

<b>KA Code</b>	<b>Knowledge Area</b>
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**

Percentage of workshop and training participants who pass required exam(s) and obtain certification as a Pesticide applicator

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

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

Not Reporting on this Outcome Measure

**Outcome #5**

**1. Outcome Measures**

Promote a variety of traditional and ethnic varieties for urban gardeners in the District of Columbia to grow and include in their diets.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	8

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

The aim of the CES Urban Gardening Program is to assist urban gardeners with growing a variety of vegetables to include in their diets. In doing so, we are introducing ethnic varieties, along with our traditional vegetables, so that ethnic groups living in the District may grow the plants that meet their culinary needs. Also, introduction of ethnic crops will help broaden the knowledge of traditional urban gardeners in the District of Columbia.

#### What has been done

We executed the program through informal education, furnishing reliable gardening information and practices, introduction of new food system ideas (ethnic crops, their nutritional and economic values) and food tasting events. Ethnic vegetables such as Celosia, Gboma, Garden Eggs, Hibiscus, Purslane, Huckleberry, Hot Peppers and Jute Leaves were introduced to community and recreation center gardens throughout the District of Columbia.

#### Results

The Ethnic Crops outreach project represents a critical aspect of the Urban Gardening program, where we interact with the public in the designated demonstration locations (7) in the District of Columbia. Importantly, we reached out to the immigrant communities of the District and beyond, to announce the availability of their home foods. The Ethnic and Specialty Crops program has reached residents of the District of Columbia, natives and immigrants, most of whom are engaged in urban gardening in community gardens or in their backyards. The immigrant residents learned how to grow and preserve their ethnic vegetables by attending our workshops and demonstration sessions. They benefited by eating fresh food and saving money. The native residents also learned how to grow and eat the new and nutritious vegetables as an addition to their current food system. Residents are now able to grow the ethnic group varieties introduced themselves. At this juncture, established and new food entrepreneurs are also learning about the new food system and the value chain therein.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems

### Outcome #6

#### 1. Outcome Measures

Trained Master Gardeners will assist with city horticultural and revitalization initiatives, providing healthy foods for vulnerable populations in the District of Columbia.

#### 2. Associated Institution Types

- 1862 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	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**

Through the DC Master Gardeners Program, forty-five (45) Master Gardener Trainees completed 50 hours of basic horticulture training, a final exam and 50 hours of volunteer service.

**Results**

226 (which includes 45 trainees) Master Gardeners and Trainees provided 8,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$33.61 per hour according to [www.independentsector.org](http://www.independentsector.org) with a total value of \$268,880 in savings to the District of Columbia. 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, benefiting city residents to include:

- 500 pounds of produce donated to soup kitchens.
- 500 hours of volunteer hours helped revitalize a 3/4 acre vacant lot and turned it into a urban farm at Walker Jones Educational Campus
- 100 Raised Beds at Schools were installed, planted and maintained and used for educational purposes.
- 3,000 spring flowering bulbs were planted at 35 sites across the city.

Additionally, 25 Master Gardeners reported savings on their grocery bills by growing their own vegetables.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems

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

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

- Other (administrative)

### **Brief Explanation**

The laboratory which will enable soil, air, and water testing is currently under construction. The facility is near completion and is scheduled for opening spring 2012. An integrated pesticide management specialist has not yet been hired. We expect that administrative changes will take place in 2012 that may include the hiring of additional staff to assist with this program.

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

### **Evaluation Results**

With the exception of external factors delineated in the previous section, the program met objectives for the reporting period. As a result of program efforts under Sustainable Agricultural Research and Education, we now have 187 out of 250 active master gardeners in the District of Columbia using sustainable agricultural techniques such as composted material as a soil amendment, organic pest control and intercropping as their crop production system. Seven demonstration gardens were installed and or maintained throughout the city at various District Parks and Recreation sites and community gardens. Two of the demonstration gardens in place from the previous year were able to double their size. Technical support and resources were also shared with other gardens in the city such as Martha's Table, Common Good City Farm, and a newly installed raised bed garden for the senior residents of Sibley Plaza. The food raised in the plots is available for the community to harvest, which is a real crowd pleaser. The gardens feature traditional vegetable varieties as well as ethnic crops. All together seventeen types of edible produce was planted in these gardens, showcasing 27 varieties. Gardens were maintained through multiple weekly site visits during which residents readily provided positive feedback. Four gardening events were provided; 2 workshops, a work day with volunteers and an in-house presentation. Technical assistance was provided through site visits and email/phone consultations and covered topics from fertilizing to pest identification/control and plant sampling for pathogen diagnosis to soil sampling. We received a number of accolades via letters from our stakeholders regarding the installation of demonstration gardens, the introduction of 27 plant varieties to include traditional and ethnic crops such as Celosia, Gboma, Garden Eggs, Hibiscus, Purslane, Huckleberry, Hot Peppers and Jute Leaves, and demonstrations where stakeholders not only tasted the food but were provided with nutritional information from the staff of the CES Center for Nutrition, Diet and Health. Immigrants and natives have reported that they are now growing some of the ethnic varieties in their home and community gardens.

Todd Leavitt, Environmental Programming, DC Department of Parks and Recreation writes:

"This past summer, I directed programs at Lederer Garden on 48<sup>th</sup> Street and Nannie Helen Burroughs Avenue in NE DC. The garden is about an acre of land with a greenhouse and environmental center. Lederer sits in a community with few resources, especially those that connect people to the land. I had the pleasure of working with Yao Afantchao from the UDC Extension on some programming at Lederer. Yao has been growing ethnic crops at Lederer for some time and having him there to bring that knowledge to the youth in the community has been a great experience for all. Aside from his knowledge, Yao was able to hold the attention of groups of twenty or more teenagers and youngsters alike, no small feat in of itself! I am hoping to continue work with Yao this month to improve the area of crops and look forward to a stronger partnership in the future. We hope Yao will continue to be an integral part of Lederer programming. Thank you."

Juanita Peterson, Recreation Specialist, DC Parks and Recreation writes:

"It has been a tremendous pleasure to interact with your staff in the collaborative effort involving UDC and DPR relating to Nutritional Garden. Many community people were made aware of the garden and were given the rare opportunity to sample its yield. The community as well as staff here immensely enjoyed harvesting various vegetables grown in the garden here at T. Hagans. A diverse group of people were tasters of all vegetation. Some people were of African, Caribbean, African American, Caucasian as well as Spanish decent.

Among the tasty items grown were Leek, cabbage, broccoli, collards, (big Boy, Roma, and Cherry) Tomatoes, Okra, Kale, Collards, Egg Plant and Lettuce.

Other Ethnic and Specialty Crops vegetables included Sawa Sawa, aka Hibiscus Sorrel of Sierra Leone, West Africa; Scotch Bonnet (Hot Pepper) considered one of the hottest peppers in the world. Garden Eggs also known as African eggplant. Avuvo is a leaf vegetable which was an instant hit with the teenagers. Also Gboma, considered an African Eggplant.

The majority of Ethnic Specialty Crops are grown mostly in Africa, Jamaica, Central America and Caribbean. These specialty Crops were introduced by Yao. New fall green leafy vegetables were planted by Mary Farrah who was and is a great help and inspiration in the Gardening project...

Overall the Garden was a successful undertaking. I am grateful to have taken part in this endeavor as lead person on this project at T. Hagans. I loved working it and partaking of its yield.

I would like profusely thank all who contributed graciously their time and efforts to make this garden venture a total success."

## Key Items of Evaluation

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

**Program # 3**

**1. Name of the Planned Program**

Childhood Obesity

**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	15%		40%	
704	Nutrition and Hunger in the Population	10%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	15%		0%	
721	Insects and Other Pests Affecting Humans	5%		0%	
723	Hazards to Human Health and Safety	10%		0%	
724	Healthy Lifestyle	15%		10%	
806	Youth Development	10%		0%	
901	Program and Project Design, and Statistics	10%		30%	
903	Communication, Education, and Information Delivery	10%		20%	
	<b>Total</b>	100%		100%	

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

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

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	11.7	0.0	1.9	0.0
Actual Paid Professional	27.4	0.0	4.0	0.0
Actual Volunteer	17.0	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
156489	0	425140	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
156489	0	328224	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1121071	0	0	0

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

**1. Brief description of the Activity**

**Obesity Research:**

1) Development of software system, MyHealth Journal on mobile computing platforms: iPhone and iPad for obesity data collection.

2) Investigaton of wireless sensing data collecton for MyHealth Journal.

**Food Stamp Education:**

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

**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) Survey instrument was designed and completed,field tested, and validated.
- 2) Research Data was collected by: reviewing survey questions; recruiting subjects; conducting Interviews; delivering cameras; collecting 4 Day Food Logs; collecting camera memory chips; reviewing survey, if needed information was incomplete; and analyzing survey & Food Log.

**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

**Developing Fuzzy-set-theory-based Data Mining Methodologies for Diabetes Data Analysis:**

1) Developed FM-PGA, a fuzzy theory based approach to differential gene analysis on a cloud computing platform.

**Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer**

1) Investigate the molecular mechanism whereby  $\gamma$ -T3 inhibits the growth of breast cancer cells: 1) determine if  $\gamma$ -T3 induces apoptosis in MCF-7 breast cancer cells is ATF-3 dependent; and 2) Determine whether  $\gamma$ -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) Resilient and non resilient families with children ages 4 - 10 years
- 3) Computer Scientists and Biologists who focus of microarray data analysis and diabetes
- 4) DC Public School teachers
- 5) Students, grades Pre-K through 9
- 6) Children 2 -5 years of age
- 7) Pre-School/Headstart and Daycare teacher volunteers
- 8) Non-commercial agency staff members
- 9) Non-profits
- 10) Residential Homes
- 11) Overweight individuals and non overweight individuals from the same environment
- 12) Obese individuals and non obese individuals from the same environment
- 13) Low income residents living in multi-family housing
- 14) Researchers/Biologists
- 15) Low-income adults who are responsible for planning and preparing the family's food with emphasis on households with young children
- 16) Low-income youth
- 17) Non-commercial agency staff members
- 18) On-going participating food handlers

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	155410	0	1009	0

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

**Patent Applications Submitted**

Year: 2011

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
<b>Actual</b>	0	1	0

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

**Output Target**

**Output #1**

**Output Measure**

- Development of new or improvement of existing tools for measurement of behavioral differences.

Year	Actual
2011	1

**Output #2**

**Output Measure**

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

Year	Actual
2011	596

**Output #3**

**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

<b>Year</b>	<b>Actual</b>
2011	10061

**Output #4**

**Output Measure**

- IRB Committee; Development of Instruments; Training on Instruments; Recruitment of project participants; Selected interventions; Review of data Data analysis; Report development - 250 Overweight and Obese individuals 150 Non Overweight and Obese individuals from the same environment Parents of participants.  
Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Design and employ a food questionnaire to identify portion sizes and quantity of fruits and vegetables for registered participants

<b>Year</b>	<b>Actual</b>
2011	1

**Output #6**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	60

**Output #7**

**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.

<b>Year</b>	<b>Actual</b>
2011	2

**Output #8**

**Output Measure**

- Design and implement educational classes to assist registered participants with improving consumption of fruits and vegetables  
Not reporting on this Output for this Annual Report

**Output #9**

**Output Measure**

- Eight workshops for teachers in the Ag in the Classroom project.  
Not reporting on this Output for this Annual Report

**Output #10**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	19394

**Output #11**

**Output Measure**

- Youth and adults will receive direct education on financial management and referrals to other resources and assistance programs

<b>Year</b>	<b>Actual</b>
2011	19394

**Output #12**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	19394

**Output #13**

**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.

<b>Year</b>	<b>Actual</b>
2011	1

**Output #14**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	1

**Output #15**

**Output Measure**

- Explore data mining concept, fuzzy 3-D correlation index, for handling incomplete and noisy data.

<b>Year</b>	<b>Actual</b>
2011	1

**Output #16**

**Output Measure**

- Classroom instruction/workshops (20 clock hours) on Food Handler Certification Regulations to include DC Code Examination or Serve Safe National Examination, and Practice Examinations

<b>Year</b>	<b>Actual</b>
2011	198

**Output #17**

**Output Measure**

- Number of new delivery systems/access points offering healthy foods

<b>Year</b>	<b>Actual</b>
2011	2

**Output #18**

**Output Measure**

- Number of food diaries collected for assessment.

<b>Year</b>	<b>Actual</b>
2011	60

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

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

O. No.	OUTCOME NAME
1	Number of teachers who have increased their awareness, knowledge, and understanding of agriculture, nutrition, and food gardening.
2	Percentage of parent participants who make better food choices (fruits/vegetables).
3	Percentage of participants who improved eating habits.
4	Percentage of decrease in the incidences of obesity in the District of Columbia
5	Improved techniques for analyzing data that may lead to increased understanding of diabetes and the development of strategies to prevent and control diabetes.
6	Development of broad applications for the inhibition of breast cancer cell proliferation and possibly cell transformation
7	Development and application of software package with fuzzy-set-theory-based methodologies to identify key behaviors that lead to pediatric obesity or resilience to pediatric obesity.
8	Number of participants who increased physical activity and experienced weightloss
9	Number of participants who improved their dietary intake, including an increase in fruits and vegetables
10	Number of participants who improved food resource management practices such as menu planning and food shopping
11	Percentage of participants, who through information and interactive approaches, have adopted better eating habits thereby increasing their daily intake of fresh fruit and vegetables.
12	Percentage of decrease in the risk factors of food borne illness.
13	Number of participants gaining awareness, knowledge and skills in Food Handling techniques.
14	Number of participants scoring a required minimum of 70% on post test and national examination.
15	Availability of fresh, healthy foods and nutrition information for DC residents
16	Development of strategies to identify low consumers of fruit, vegetable, and whole grains and promote healthy food consumption for elderly individuals living in the District of Columbia.

**Outcome #1**

**1. Outcome Measures**

Number of teachers who have increased their awareness, knowledge, and understanding of agriculture, nutrition, and food gardening.

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

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

Not Reporting on this Outcome Measure

**Outcome #3**

**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**

<b>Year</b>	<b>Actual</b>
2011	5005

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

**Issue (Who cares and Why)**

According to the 2009 Behavioral Risk Factor Surveillance System, 67.5% of U.S. adults aged 18 years or older do not eat fruit at least 2 times a day, and 73.7% do not eat vegetables at least 3 times a day. The 2008 National Health Interview Survey found that 36.2% of adults report no leisure-time physical activity and 81.8% do not meet current federal guidelines for physical activity and muscle strengthening ([www.cdc.gov/chronicdisease/resources](http://www.cdc.gov/chronicdisease/resources)). The Commodity Supplemental Food Program (CSFP) is funded by USDA and provides food packages for low-income pregnant and breastfeeding women, other new mothers up to one year, postpartum, infants, children up to their sixth birthday and elderly persons at least 60 years of age.

Due to economic hard times and limited resources of individual and families, shelters provide temporary living for individuals and families in need. Sasha Bruce Independent Living Program a shelter that provides up to 18 months of temporary housing for teens between 16-18 years of age. Teens are required to enroll in school, work part-time and save portions of their income.

### **What has been done**

CES collaborates with The Greater Washington Urban League and provided age appropriate health and nutrition education, food demonstrations using the commodity foods, recipes using the commodity foods and taught the participants how to prepare the foods for greater utilization in their diets. A 12-month calendar to assist participants to focus on nutrition and health and keep health appointments was developed and provided to each participant. 4,877 adults and 120 youth participated in the 118 workshops and 59 food demonstrations. The workshops also addressed issues of food insecurity, food safety, obesity, and chronic disease faced by many low-income residents.

The EFNEP paraprofessional quickly learned that the teens bought and ate carryout and did not cook. They would run out of food and money prior to the end of the month. A series of 10 lessons on healthy eating including dietary quality, food safety, food security, food resource management and physical activity including hands-on cooking were taught to the 8 teens. The teens would often say, "I know nothing about cooking."

### **Results**

A Pre and Post Retrospective Survey instrument was developed and administered to a random sample of 168 of the adult participants of which 67.3% were female and 32.7% male; 91.7% Black, 5.4% White Hispanic, 1.8% White Non-Hispanic, and 1.2% Asian. The results revealed that 97.5% of the adults were happy with the nutrition interventions, 97% were happy with the food demonstrations/food tasting, and 95.2% with the physical activity. Additionally, 89.4 % of adults are now eating more fruits; 93.9 % of adults are now eating more vegetables ; 85.8 % of adults are now eating more whole grains; 70.5 % of adults are now drinking more fat-free and low-fat milk; 76.3 % of adults are participating in physical activity most days; 77.3 % of adults have reduced the intake of sodium; and 77.3 % of adults have reduced the intake of trans and saturated fats. A randomly selected subsample of 80 of the 168 participants revealed 96.3% consumed one or more extra servings of fruits; 96% consumed one or more extra servings of vegetables; 83.8% consumed one or more extra servings of whole grains; and 40.5% consumed one or more extra servings of fat free or low fat milk; and 30% are participating in physical activity for an extra 30+ minutes daily.

At the end of the sessions, 100% of the teens learned how to read recipes, cook several dishes, saved money and no longer ran out of food and money prior to the end of the month. Their favorite dish was stir fry brown rice with vegetables. They also enjoyed Quinoa a grain that is a complete protein.

## **4. Associated Knowledge Areas**

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



**Outcome #4**

**1. Outcome Measures**

Percentage of decrease in the incidences of obesity in the District of Columbia

Not Reporting on this Outcome Measure

**Outcome #5**

**1. Outcome Measures**

Improved techniques for analyzing data that may lead to increased understanding of diabetes and the development of strategies to prevent and control diabetes.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	1

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

**Issue (Who cares and Why)**

Diabetes is a group of diseases marked by high levels of blood glucose, also called blood sugar, resulting from defects in insulin production, insulin action, or both. Diabetes was the seventh leading cause of death based on U.S. death certificates in 2007. Overall, the risk for death among people with diabetes is about twice that of people of similar age but without diabetes (NIDDK, NIH). The overall aim of this interdisciplinary research is to develop a series of fuzzy-set-theory-based data mining approaches for finding genetic, environmental and behavioral factors associated with diabetes.

**What has been done**

In 2011, we successfully developed FM-PGA, a fuzzy theory based approach to differential gene analysis on a cloud computing platform. FM-PGA integrates the FM-test with Map-Reduce Parallel Genetic Algorithms and applies them to gene microarray data analysis. It compares microarray gene expression data in parallel on a cloud computer cluster to identify the significant genes associated with diabetes. A manuscript has been published.

**Results**

To the best of our knowledge, we are the first to develop gene microarray data analysis on a cloud computing platform. FM-PGA has achieved very promising performance both in terms of time and classification accuracy. We also submitted a renewal proposal to continue this development. The proposal has been approved.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
901	Program and Project Design, and Statistics

#### Outcome #6

##### 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
2011	1

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

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

Vitamin E includes a family of micronutrients consisting 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 is to understand the molecular basis of the action of gamma-T3.

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

The project made significant progress in the last year. 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.

###### **Results**

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. 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. In summary, we demonstrate that gamma-T3 modulates ER stress signaling and have identified ATF3 as a molecular target for gamma-T3 in breast cancer cells. As mentioned above, we demonstrated the modulation PERK and IRE1alpha dependent ER stress related pathways in MCF-7 and MDA-MB 231 cells when treated with gamma-T3. PERK phosphorylates eIF2alpha and attenuates translation machinery leading to ER stress. Remarkably, PERK signaling has also been shown to induce autophagy as a protective response to cellular insults, such as hypoxia and nutrient deprivation. Similarly, IRE1a has also been implicated in autophagic response.

#### 4. Associated Knowledge Areas

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

#### Outcome #7

##### 1. Outcome Measures

Development and application of software package with fuzzy-set-theory-based methodologies to identify key behaviors that lead to pediatric obesity or resilience to pediatric obesity.

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2011	1

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

**Issue (Who cares and Why)**

aa

**What has been done**

In this period, we continued to develop our software system, MyHealth Journal, on mobile computing platforms: iPhone and iPad, for obesity data collection. To further leverage the strength of mobile computing, we investigated wireless sensing data collection for MyHealth Journal. The plan is to use remote sensor that is attached to human body, to collect bio signals which can be transmitted back to iPhone or iPad and be recorded by MyHealth journal automatically.

**Results**

The software system we developed for both personal computer and mobile devices such as 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.

Two students were recruited and trained by the PI. Under the PI's direction, they conducted research on the capability of wireless signal transmission and collection of iPhone and iPad during summer 2011. A technical report was written on the findings. We plan to continue research in this direction this year.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
901	Program and Project Design, and Statistics

**Outcome #8**

**1. Outcome Measures**

Number of participants who increased physical activity and experienced weightloss

Not Reporting on this Outcome Measure

**Outcome #9**

**1. Outcome Measures**

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

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	2364

**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](http://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 2,458 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 10,104 nutrition workshops and 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 2011 at the end of the 2010-2011 school year for a sample of 246 students ages 2 to 5 years old.

**Results**

The results revealed 95.2% consuming at least 1.5 cups of fruit daily; 87.2% consuming at least 1.5 cups vegetables; 90.2% drink 2 cups of low fat or fat free milk; 88.8% consuming at least 5oz whole grains; 93.9% physically active; 82.1% have balance caloric intake with caloric expanded; 92.1% identified healthy food choices; 94.1% tried new foods offered at school; 84.3% choose fruits and/or vegetables during classroom parties; 70.6% bring fruit and/or vegetables as a snack. A second part of the instrument surveyed 176 of the preschool children to evaluate teachers' behavioral changes during the school year. The results revealed that 87.2% of the teachers offered healthy food choices to the students; 87.3% encouraged students to eat breakfast; 85.1% reminded families to bring healthy snacks for school parties; 86.4% encouraged the children to be physically active; and 88.3% made healthier personal food choices.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior

**Outcome #10**

**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
2011	765

**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. 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.

### **What has been done**

Paraprofessionals conducted planned, direct nutrition education 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 56 adults who participated in the program had positive knowledge, behavior and change in condition changes; 98.1% reported planned meals ahead of time; 98.1% reported comparing prices before buying food; 13.7% reported not running out of food before the end of the month; 88.0% reported shopping with a grocery list; 67.3% reported not leaving food out for more than two hours; 76.0% reported thawing foods at room temperature; 86.3% reported having prepared foods without adding salt; 96.0% reported using the Nutrition Facts on the food label to make food choices; and 90.0% reported eat something in the morning within two hours of waking up. 89.3% with positive changes in any food group; 72.0% improving nutrition practices; 51.8% improving the amount of whole grains consumed; 25.0% improving the amount of fruits consumed; 44.6% improving the amount of vegetables consumed; 33.9% improving the amount of fat-free and low fat milk consumed; 39.3% improving the quality of protein and consuming more beans; 71.4% reported eating three or more meals/snacks daily; 43.5% reported participating in 30 to 60 minutes of moderate activity daily; 39.3% reported a 20-29% decrease in calories from fats; 37.5% reported an increase in dietary fiber intake of 5-15 grams daily; 41.0% reported a decrease in sodium intake of less than 1500 mg; 63.0% reported practicing improved food resource management; and 32.0% practicing improved food safety.

Of the 709 youth were evaluated and 94% consuming a variety of foods; 99% increasing knowledge of the essentials of human nutrition; 38% increasing their ability to select low-cost, nutritious foods; and 66% improving practices in food preparation and safety.

## **4. Associated Knowledge Areas**

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

### **Outcome #11**

#### **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

**Outcome #12**

**1. Outcome Measures**

Percentage of decrease in the risk factors of food borne illness.

Not Reporting on this Outcome Measure

**Outcome #13**

**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**

<b>Year</b>	<b>Actual</b>
2011	19394

**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. Food security is paramount to health and well-being among the District of Columbia Population.

**What has been done**

Food safety and hand washing were conducted with 2,458 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. The adult



sessions were on safe food handling procedures, foodborne illnesses, temperatures. A pre and posttest retrospective survey was conducted at the end of the interventions.

**Results**

A retrospective random sample of 176 classrooms of the 2,458 children 2-5 years of age revealed that 93.7% 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. 100% of the 16,936 adult gained awareness, knowledge and skills in food handling techniques.

**4. Associated Knowledge Areas**

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

**Outcome #14**

**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
2011	66

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

**Issue (Who cares and Why)**

Food handlers working in the food service industry are responsible for safe handling techniques and procedures, as improper food handling and unsafe conditions can lead to foodborne illness, disease, and in some cases, death. Foodborne illness is responsible for approximately 76 million and 5,000 deaths per year in the U.S. Costs for foodborne illnesses is estimated between 10 and 83 billion dollars annually.

**What has been done**

Five different Food handler certification training classes were conducted for a total of 20 clock hours for each session. Sixty-Six individuals participated. A pre-test was administered prior to the start of training sessions and immediately following each session a post-test was administered. The DC Code Examination and the National Certification Exams were also administered.

**Results**

Sixty-six participants completed the training. The results revealed a mean score of 68.6% on the pretest; mean score of 93% on the posttest; mean score of 86% on the DC Code exam; and a mean score of 91% on the national exam. 100% of the participants scored the minimum of 70% on the posttest and the national exam. 20% of the participants received a perfect score of 100% on the posttest. 100% of the participants are now employed in the food service industry.

#### 4. Associated Knowledge Areas

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

#### Outcome #15

##### 1. Outcome Measures

Availability of fresh, healthy foods and nutrition information for DC residents

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2011	483

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

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

Our bodies require proper nutrition to achieve their true health potential. Avoiding fats, sugars, and starchy carbohydrates is key to improving our diets. Access is a factor in our food choices. The lack of healthy foods such as fruits and vegetables in one's immediate environment, may result in the elimination of those items in one's diet. Availability often leads to better food choices.

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

The Cooperative Extension Service joined forces with the Mid-Atlantic Growers and Consumers Network (MAGCC) farmers (the agricultural vendors) to implement a Farmers' Market in the city. The Market was located on our College Campus and served residents in the immediate vicinity of the University. The diverse community includes children, youth, adults, and seniors. Each Saturday, May through November, farmers provided fresh fruits and vegetables for sale at the Market. The CES Center for Nutrition, Diet and Health participated, providing valuable information via printed literature, demonstrations, and food tasting. Further, through our DC MarketMaker website, we provided residents with links to farmers within the mid atlantic region who had fresh produce and meats available for sale. These access points give residents further

options or access to healthy foods.

### Results

Farmers' markets are enjoyable settings that attract individuals for their open atmosphere, variety, and farm fresh feel. Our records indicate an average of 146 paying customers in the second year of operation over an average of 337 from the previous year. Our Farmers' Market survey analysis illustrates that children between the ages of four and twelve do heavily influence the buying habits of their parents, and could be supported with extension of research funding to corroborate empirically the influence of children in the creation of positive eating habits. Over 187,923 respondents have had access the DC MarketMaker website. Over 53% visitors to the site responded to a survey instrument that they had experienced a change in buying habits (i.e., participating in the Farmers Market, and have benefited economically from the additional channel of distribution that it represented. The Mid-Atlantic Growers and Consumers Network (MAGCC) farmers (the agricultural vendors) reported 48% of their membership indicated that their participation in the Farmers' Market significantly benefited them individually; significantly enough that their sustainability needs will include further participation in the UDC Farmers Market for 2012.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle
903	Communication, Education, and Information Delivery

### Outcome #16

#### 1. Outcome Measures

Development of strategies to identify low consumers of fruit, vegetable, and whole grains and promote healthy food consumption for elderly individuals living in the District of Columbia.

#### 2. Associated Institution Types

- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2011	60

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

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

Consumption of the appropriate amount of fruits and vegetables in the diets of the elderly is essential for healthy living. Intervention strategies will be developed/designed as a result of data collected using a survey instrument that has been constructed to:

- a. Compare knowledge, priorities, and attitudes of high fruit, vegetable, and whole grain consumers with low fruit, vegetable, and whole grain consumers.
- b. Compare the cognitive and affective characteristics of these two groups in order to assess their effect on food choices and consumption
- c. Determine the extent to which elderly citizens provide nutritional care to children. (The assumption is that interventions with child caregivers will positively affect the children in their care.)

### **What has been done**

Our research assistants successfully completed the collection of 4-day dietary data from 60 participants who used the camera to document their intake. The registered participants were from congregate sites in the District of Columbia operated through the assistance of the office on Aging. Research Data was collected by: reviewing Survey Questions; recruiting subjects; conducting Interviews; delivering cameras; collecting 4 Day Food Logs; collecting camera memory chips; reviewing Survey if needed information was incomplete; and analyzing survey & Food Log.

### **Results**

Based on the analysis, the following tables provide the results of the survey:

The survey data suggests:

- Whole grain numbers rely on clarity of definitions that interviewers will be able to explain.
- Subjects seemed generally aware of the benefits of fruits, vegetables, and whole grains, even when they were not consumed in adequate quantities.
- Diagnosis of morbidity changes eating behavior.
- It is not unusual for elderly individuals to prepare regular meals for children under 13 years of age.

The 4-day dairy will be used to partition subjects into two groups:

Group A (high consumers) and Group B (low consumers).

- Group A - participants that are high consumers of fruits and vegetables i.e., consumed more than 5 servings of fruits and vegetables
- Group B - Low consumers

Data analysis will provide guidance for the development of interventions for low consumers of fruits, vegetables, and whole grains.

## **4. Associated Knowledge Areas**

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

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

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

- Appropriations changes
- Other (programming/administrative)

### **Brief Explanation**

The Ag in the Classroom project is no longer active. A program leader has not been hired to replace to previous incumbent. Due to budgeting issues, the program may be indefinitely suspended.

During Fiscal Year 2011, many changes took place in the SNAP-Ed program. The program went from a match program to a grant program with a funding ceiling, the program loss significant funding. The annual budget was reduced from \$1,641,000.00 to \$544,200.00, 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.

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

### **Evaluation Results**

Considering budget cuts as described in the External Factors section, the SNAP-Ed program performed well. SNAP-Ed conducted 10,957 workshops/ demonstrations at 124 sites in all eight (8) Wards in the District of Columbia including workshops/demonstrations as follows: 1,604 in Ward 1; 425 in Ward 2; 105 in Ward 3; 3,600 in Ward 4; 636 in Ward 5; 939 in Ward 6; 813 in Ward 7, and 1,939 in Ward 8. Additionally, 315 individuals completed certificate programs. A total of 155,568 contacts with the assistance of 467 extension-trained teachers, 15 volunteers, and facilitators in senior programs were generated. The 155,568 contacts by Ward were as follows: 21,178 in Ward 1; 7,238 in Ward 2; 2015 in Ward 3; 55,422 in Ward 4; 9,088 in Ward 5; 11,932 in Ward 6; 17,113 in Ward 7; and 31,582 in Ward 8.

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 follow:

Juanita E. Thornton, Early Child Development Center #8 writes, "... since Ms. Swanson, nutrition educator has been visiting my classroom for the last year and half, I have noticed how the children are at least willing to try the different foods she has been bringing in. As I share with the parents on our nutritional Wednesdays the importance of eating healthy and exercising, the feedback from the parents is great. Some parents have shared that by eating the rights foods (fruits, vegetables, and protein), their child's behavior has calmed down, waking up from bedtime has improved, and they are retaining information effectively. I too think the newsletters that she sends home, helps the parents with planning meals and healthy snacks to eat at home. Of course here at school, the menus are appropriate for the different age levels that we serve. I have noticed a change in the behavior of the children and how they are staying more focused on directions from the teachers. Both the parents and I are extremely pleased to learn different ways to prepare

veggie pizza with a whole wheat English muffin and fat-free cream cheese, fruit "ice cream" cones from fat-free yogurt, and tasting different textures of fruits and vegetables. Cutting out the sugar and incorporating a different fruit in place of it is AWESOME!"

Katrina Jackson, Preschool/Head Start Teacher, Neval Thomas Elementary School, 650 Anacostia Avenue, NE writes, "I have a combination of three and four year old children. I keep some of my children for 2 years, so half of my class has had the opportunity of 2 years working with Ms. Katey Swanson, nutrition educator. Most of my children are able to identify familiar and unfamiliar fruits and vegetables. They are able to use their sorting and classification skills when identifying the food and putting the foods into their correct food group. Some parents have noticed their children choosing the healthier snacks instead of the junk foods when shopping for groceries. Their vocabulary skills are strengthened as they discuss the different foods, food origins, colors, etc. The children can now explain why we should eat healthy foods and how the healthy foods affect the body. Other health tips such as hand washing and the importance of hand washing, hygiene, and germs are discussed as well. This helps the children become aware of how germs are spread and how one should conduct themselves when sneezing or coughing."

Christine Rey, Prekindergarten/Head Start Teacher, Garfield Elementary School, 2435 Alabama Avenue, SE, writes, "Since working with you and the SNAP-Ed nutrition program, I've noticed a drastic change in the children's understanding of healthy foods and other healthy activities (hand washing, exercise, etc.) My children are much more aware of where food comes from; the differences between fruits and vegetables; and healthy vs. unhealthy foods. I've even heard children correctly categorize foods as "dairy" or "produce." I know that this knowledge is from the SNAP-Ed program. I've also noticed an increase in awareness of the importance of exercise. The children listen to their hearts and can tell when their bodies are moving fast or slow. But, perhaps most importantly, I've been amazed to see how excited the children are to try new foods. My children are now eating (and enjoying!) new fruits and vegetables and whole grains. The children are more conscious of what they're eating and are more willing to try new foods. Not only are the children trying these new foods at school but they are talking about these new foods at home and in some cases asking their families to try/buy them too! SNAP-Ed is an effective-and essential- program that has taught my children how to make healthy choices, which will set them on the right path for a healthy life! Thank you so much for everything that you do for my children and families. You are greatly appreciated!"

The evaluation methods included a retrospective survey provided at the end of the school year. Every participating teacher completed the survey and provided additional comments they have regarding the SNAP-Ed program. The retrospective survey gathered behavior change data. The program decided to have the teachers complete the retrospective survey for they are with the children for the greatest length of time and are able to observe behavior. Other evaluation methods included observational studies, focus groups with teachers and with parents, and pretest, posttest and follow-up posttest. The parent focus groups included the same concepts on the retrospective survey completed by teachers.

Our research in Diabetes continues to progress. To the best of our knowledge, our researchers are the first to develop gene microarray data analysis on a cloud computing platform. Our Breast Cancer research made significant progress in the last year. 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. During this reporting period, we continued to develop our software system, MyHeath Journal, on mobile computing platforms: iPhone and iPad,

for obesity data collection. This 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.

### **Key Items of Evaluation**

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

**Program # 4**

**1. Name of the Planned Program**

Urban Families, Youth, and Communities

**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%	
	<b>Total</b>	100%		0%	

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

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

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	11.9	0.0	0.0	0.0
Actual Paid Professional	17.6	0.0	0.0	0.0
Actual Volunteer	379.0	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
479750	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
479750	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
276725	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 not used in this program iva some webinars were converted to training sessions for both staff and 4-H volunteers.

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

**1. Standard output measures**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	18627	116818	11894	0

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

**Patent Applications Submitted**

Year: 2011

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
<b>Actual</b>	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
2011	6

**Output #2**

**Output Measure**

- Number of participants in parenting workshops.

Year	Actual
2011	48

**Output #3**

**Output Measure**

- Number of parenting support groups formed.

<b>Year</b>	<b>Actual</b>
2011	3

**Output #4**

**Output Measure**

- Percentage increase in the number of parenting support groups.  
Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Conduct a minimum of 20 sessions in the area of financial literacy.

<b>Year</b>	<b>Actual</b>
2011	66

**Output #6**

**Output Measure**

- Conduct 5 sessions per year for junior and senior high schools in the District of Columbia on financial planning.  
Not reporting on this Output for this Annual Report

**Output #7**

**Output Measure**

- Number of individuals in co-ops and subsidized housing trained on roles, rights, and responsibilities of co-op members, managers, and directors.  
Not reporting on this Output for this Annual Report

**Output #8**

**Output Measure**

- Develop newsletter and/or fact sheets for District residents so they can perform basic/advanced repairs in and around their home.  
Not reporting on this Output for this Annual Report

**Output #9**

**Output Measure**

- Conduct hands-on workshops for District residents in basic and advanced home repair.  
Not reporting on this Output for this Annual Report

**Output #10**

**Output Measure**

- Increase in the number of 4-H clubs throughout the city.

<b>Year</b>	<b>Actual</b>
2011	17

**Output #11**

**Output Measure**

- Hold a minimum of 5 co-op training sessions for co-op members and individuals in subsidized housing.  
Not reporting on this Output for this Annual Report

**Output #12**

**Output Measure**

- Develop a videotape series, webpage and links to provide continuous scheduled training and information on co-op housing issues.  
Not reporting on this Output for this Annual Report

**Output #13**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	110

**Output #14**

**Output Measure**

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

<b>Year</b>	<b>Actual</b>
2011	200

**Output #15**

**Output Measure**

- Number of 4-H Clubs in Spanish Speaking Communities within the District of Columbia

<b>Year</b>	<b>Actual</b>
2011	15

**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 are now or have purchased homes with some form of financial assistance.
5	Number of participants able to make repairs as well as communicate with contractors in a professional manner.
6	Number of small business participants who changed their minds about developing and maintaining a successful business in the District of Columbia.
7	Number of Youth demonstrating an immediate and long-term commitment to civic engagement.
8	Promote financial sustainability via workshops and associated activities to change residents attitudes regarding the need for savings and investments.

**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**

<b>Year</b>	<b>Actual</b>
2011	1240

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

**Issue (Who cares and Why)**

Team building skills/team work are critical to the growth and success of our youth. A good understanding of team work is critical in youth development so that our youth can be effective as participants in a wide range of activities at home, school, sports events, and other community projects, in general. Knowledge of the elements of team work are essential in preparing youth as future leaders. These elements will assist in conflict resolution, achieving goals and objectives, respecting opinions of others, sharing ideas, effective communication, and building trust.

**What has been done**

Forty-two (42) 4-H teams were established this program year in the District of Columbia. Each team learned the essential elements of team work as they developed clubs and established officers. Through the LifeSmarts Program, 45 high school youth worked as a team to qualify for the competition. A multi-state robotics fair was held in Maryland where we hosted 100 youth from Maryland and the District of Columbia. Twelve (12) new clubs robotics clubs have been formed and 12 new volunteers leaders have received training to help planning for their specific 4-H clubs. Fifty-two (52) 4-H clubs officers were selected and worked as teams to implement 4-H clubs successfully with their volunteer leaders.

**Results**

210 youth in 4-H clubs learned valuable lessons about the essential elements of team work through their club activities. We have greater participation in the 4-H program through the LifeSmarts program and the youth report a greater knowledge of consumer issues as a result of participation in the competition. Moreover, through a survey, they report a great reliance on their team members and an appreciation for their coaches. Youth participating in the robotics competitions want to remain a 4-H club team and the robotics program is growing with 15% greater participation than last year. Also, via surveys youth indicate that they have a greater

reliance and appreciation of their team mates and volunteer leaders. Youth in 4-H clubs report enjoying making new friends and gaining a sense of belonging.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

<b>Year</b>	<b>Actual</b>
2011	906

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

**Issue (Who cares and Why)**

Youth can contribute positively to their families and communities. For some youth, responsibility is required earlier in their lives as a result of family circumstances, cultural expectations, and societal demands. For example, many military youth have increased responsibility after a parent has been deployed; teen moms have new responsibilities that they sometimes fear; and young people with incarcerated parents take on new roles in their extended families when their parents become incarcerated. They often suffer lower self esteem and and lost of their trust in themselves and their established beliefs. It is important that we provide activities to properly develop our youth so that they may accept and demonstrate appropriate responsibility.

**What has been done**

44 military youth participated in an one week overnight camp in Middleton, Maryland and learned about the stages of deployment cycle, practiced their public speaking abilities, and were engaged in problem solving and critical thinking exercises. Five Military Family Fun Days were held, serving more than 300 military youth participants and 400 total military participants. In the Latino community, 90 expectant teen moms participated in 4H club activities and were provided nutrition classes, demonstrations, and leadership program activities. Seventy-two (72) youth with incarcerated parents participated in regular 4-H activities that allowed them to interact with other youth having their same experiences and explore ways they could help their new caregivers.

**Results**

85% of Latino pregnant youth participating in 4H activities report feeling more confident in taking on responsibilities as new mothers; 95% of expectant Latino teens report feeling less alone in addressing responsibilities as they face new parenthood; 87% of youth participating in visits with their parents inside the correctional facility report taking on greater responsibility to help around the house of their new homes as a result of the respect and appreciation the parents have for the caregivers; 100% youth participating in the 4H Life Incarceration Program for children of incarcerated parents, report interest and confidence in handling the responsibilities of becoming a 4H officer; 80% of youth report taking on the responsibility of helping to prepare dinner as a result of participation in their 4H cooking club. The majority of teens participating in the Operation Military Kids Program report having a greater sense of pride in their parents, resulting in them taking on more responsibilities in their home to support the non deployed parent.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
802	Human Development and Family Well-Being
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
2011	200

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

**Issue (Who cares and Why)**

Incarcerated parents lose their sense of parenting as they see their children less than usual when they become incarcerated. There is a need to assist incarcerated parents with developing and/or enhancing parenting skills.

**What has been done**

Many of the parents registering for the classes report feeling like they need help with parenting skills before they became incarcerated. A town meeting was presented to 300 incarcerated



parents offering them a chance to participate in the program. 48 parents have successfully completed the parenting education classes.

**Results**

The classes have been very successful and have spurred new partnerships with prison officials. Parents are conducting 4-H club meetings inside the facility in an classroom setting. New parenting classes have began with a another group of parents interested in participating in the 4-H program. Seven new volunteer leaders have been identified to help us implement 4-H club activities. Two UDC students majoring in Criminal justice have been assigned to work with the 4-H staff in implementing the program activities.

We have now started a new 4-H music program in the juvenile area of the jail and we are working to secure funds to provide scholarships to the incarcerated youth.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

**Outcome #4**

**1. Outcome Measures**

Number of DC residents who participated in a Financial Literacy workshop who are now or have purchased homes with some form of financial assistance.

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 small business participants who changed their minds about developing and maintaining a successful business in the District of Columbia.

Not Reporting on this Outcome Measure

**Outcome #7**

**1. Outcome Measures**

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

Not Reporting on this Outcome Measure

**Outcome #8**

**1. Outcome Measures**

Promote financial sustainability via workshops and associated activities to change residents attitudes regarding the need for savings and investments.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2011	804

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

**Issue (Who cares and Why)**

Understanding finance is essential to ensuring financial stability for individuals and families in the District of Columbia. The ability to understand finance protects and prepares residents to save and invest in their future.

**What has been done**

The University of the District of Columbia Center for Sustainability/Basic Financial Planning Program delivered consumer/research-based financial education to 967 residents in Washington, DC via 66 workshops and mass media, often in partnership with community groups, volunteers and professionals located in the city. The financial education program includes:

- Basic financial management
- Credit and predatory lending
- Saving and investing
- Identity theft and consumer fraud
- Estate planning and insurance

A total of 66 workshops were conducted.

**Results**

967 DC residents increased their knowledge in financial literacy through participation in financial workshops. More specifically, pre and post tests indicate that 86% or 804 residents participating in workshops agreed to write a budget and to begin saving and investing.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

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

##### External factors which affected outcomes

- Appropriations changes
- Other (Administrative)

##### Brief Explanation

In implementing the 4-H LIFE program, our program for children with incarcerated parents, with our parenting education classes we were late in getting our staff on board because of internal problems within the university systems. This problem causes us to lose some funding. After the team got started the program progressed in a very positive direction.

A program manager has not been replaced. The previous incumbent retired. Due to program changes and budget cuts, this program may be suspended until fall 2012.

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

##### Evaluation Results

Currently, the CES Center for Sustainability is being restructured as a continuous improvement process to enable us to better serve the residents of the District of Columbia. With the leadership of a newly appointed Dean and Director of the Agricultural Experiment Station and the Cooperative Extension Service, Dr. Sabine O'Hara, we expect our programs to further flourish, producing substantial impacts in the coming year. The majority of the objectives for the 4H program were successfully met with several significant impacts.

Results from the parenting survey from the 4H program follows:

68% of the parent's participant report that they will make different decisions about discipline when it comes to spanking their children.

87 % of parents report that they will make different decisions about cursing directly at their children or around their children or any children.

100 % of the participants report that the classes were well planned and they gained a lot from the discussion with the other parents.

100 % of the participants report that they felt comfortable about expressing

themselves in the meetings and they would recommend the program to other inmates.

88% of the parents report that they have a better understanding of child development and how it affects behavior of children at different stages.

100% report feeling better able to manage the funds and make a budget when they have financial resources again.

210 youth in 4-H clubs learned valuable lessons about the essential elements of team work through their club activities. We have greater participation in the 4-H program through the LifeSmarts program and the youth report a greater knowledge of consumer issues as a result of participation in the competition. Moreover, through a survey, they report a great reliance on their team members and an appreciation for their coaches.

85% of Latino pregnant youth participating in 4H activities report feeling more confident in taking on responsibilities as new mothers; 95% of expectant Latino teens report feeling less alone in addressing responsibilities as they face new parenthood; 87% of youth participating in visits with their parents inside the correctional facility report taking on greater responsibility to help around the house of their new homes as a result of the respect and appreciation the parents have for the caregivers; 100% youth participating in the 4H Life Incarceration Program for children of incarcerated parents, report interest and confidence in handling the responsibilities of becoming a 4H officer; 80% of youth report taking on the responsibility of helping to prepare dinner as a result of participation in their 4H cooking club. The majority of teens participating in the Operation Military Kids Program report having a greater sense of pride in their parents, resulting in them taking on more responsibilities in their home to support the non deployed parent.

#### Financial Literacy:

967 DC residents increased their knowledge in financial literacy through participation in financial workshops. More specifically, pre and post tests indicate that 86% or 804 residents participating in workshops agreed to write a budget and to begin saving and investing.

### Key Items of Evaluation

Below are changes in attitudes that will hopefully lead to changes in behavior for parents participating in parenting skills programs. This type of attitude change is significant. A positive change of behavior will perhaps change, for the better, the attitudes, behavior and condition of the children involved.

68% of parents report that they will make different decisions about discipline when it comes to spanking their children.

87 % of parents report that they will make different decisions about cursing directly at their children or around their children or any children.

88% of the parents report that they have a better understanding of child development and how it affects behavior of children at different stages.

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

**Program # 5**

**1. Name of the Planned Program**

Sustainable Energy

**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	10%		100%	
403	Waste Disposal, Recycling, and Reuse	90%		0%	
	<b>Total</b>	100%		100%	

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

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

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	1.0	0.0
Actual Paid Professional	1.6	0.0	2.0	0.0
Actual Volunteer	18.0	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
57989	0	96919	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
57989	0	101155	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
12149	0	0	0

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

**1. Brief description of the Activity**

a) a feasibility of the design and implementation of an operational digester, the monitoring and

control of the different biodegradation process variables and experiments to boost or maximize the gas production was conducted; b) The design and evaluation of a lab-scale anaerobic digester.

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

- DC Hotels
- DC Restaurants

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	442	0	31	0

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

**Patent Applications Submitted**

Year: 2011  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2011	Extension	Research	Total
<b>Actual</b>	0	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- Design of Fuzzy Logic Controller of the Anaerobic Digester System

Year	Actual
2011	1

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

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

O. No.	OUTCOME NAME
1	Environmental benefits through the use of biofuels.

## **Outcome #1**

### **1. Outcome Measures**

Environmental benefits through the use of biofuels.

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2011	1

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

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

The specific research objectives of the study include a) Understanding of organic waste collection methods in hotels and restaurants; and b) Possible quantification of organic waste. The feasibility study research methodologies include: a) Preparation of survey questioner to collect the data about the current generation and waste processing of organic waste from a variety of sources; b) Implementation of survey through site visits; c) Quantification of daily organic waste and evaluation of waste processing through the experimental anaerobic digester. The goal for designing a lab-scale anaerobic digester was to build a mini anaerobic digester that can generate biogas in the laboratory and to provide preliminary data and identify key aspects of the design for an efficient, reliable, and low-cost anaerobic digester for waste processing. The specific research objectives the lab-scale digester include: a) The design of a small scale anaerobic digester that can be operated with a minimum of monitoring; b) Regulating, and adjusting and optimization of the experimental condition to maximize the amount of biogas produced per unit time with the proposed mini digester. The research methodologies for the small-scale anaerobic digester include: a) Design and fabrication of laboratory scale mini anaerobic digester; b) Analysis of the content of the biogas produced by the proposed mini digester using Gas.

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

A feasibility study was conducted to implement an anaerobic digester for biogas production for District of Columbia hotels and restaurants. In order to understand the ways that organic waste is collected and to quantify the daily organic waste, a survey questionnaire was prepared. A significant effort was made to collect this data; however, with little success. Only few hotels agreed to participate and to provide the data. The most important finding is that organic waste had to be collected in separate bins; it is currently mixed with inorganic waste. Therefore, the project must design separate bins for organic waste collection and education is required for implementation. Initially, we proposed to use organic wastes from hotels and restaurants in the Washington DC Metropolitan area; however, very limited number of hotels or restaurants are



willing to participate in this program. Cow manure was collected at one of the facilities of CMREC (Central Maryland Research and Education Center) at Clarksville. Based on solid content, two different cow manures used in this project were collected from this site: a) Raw Manure (8-25% solids); and b) Liquid Manure containing less than 3% solid.

### Results

The results of the feasibility study are as follows: a) Washington D.C. is one of the nation's most popular tourist destinations, attracting nearly 20 million visitors annually; b) In the District, there are approximately a total of 230 hotels, bread & breakfast inns, lodgings and vacation rental and more than 1200 hotels and restaurants. Food Waste is the single largest component of the waste stream by weight in the United States. Americans throw away about 43.6 million tons of food each year; c) According to the American Hotel and Motel Association (AHMA), 25-30% of the total waste stream generated by the hotel industry is food waste; and d) The quantity and the composition of waste generated by restaurants depends on the size of the restaurant, the type of the restaurant, and number of meals served. Biogas was produced when cow manures with different solid content were used. The biological reactions of the different species in a single stage reactor can be in direct competition with each other. For this reason, biogas production under different conditions is not presented. However, some preliminary conclusions were summarized: 1) Low cost and low maintenance mini Anaerobic digesters were successfully built and used to produce biogas from raw manure and liquid manure; 2) For all biogas samples produced by the mini digester, methane content ranges from 46.9% to 64.6%; and 3) Preliminary data shows that raw manures are a better source for the mini digester to produce biogas than liquid manure (produces biogas faster with more methane content).

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse

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

#### External factors which affected outcomes

- Other (District businesses unwilling to participate in feasibility study data collection)

#### Brief Explanation

Several businesses in the District chose not to participate in the planned feasibility study.

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

#### Evaluation Results

Sustainable Energy is our smallest program. In the coming year, it will be expanded. The current research project will terminate soon; there are no plans to extend the project. We expect that program changes will occur as a new administrator/Dean and Director for the Agricultural Experiment Station and the Cooperative Extension Service, Dr. Sabine O'Hara, has been appointed. All programs across the College will be carefully reviewed/assessed to ensure relevance and impact. Accordingly, we will make

modifications to our five year plan of work. The objectives of this program were met. A feasibility study was conducted to implement an anaerobic digester for biogas production for District of Columbia hotels and restaurants ; however; data collection for the feasibility study was somewhat limited due to the lack of response from area businesses. The results of the feasibility study indicate the following:

- Washington D.C. is one of the nation's most popular tourist's destinations, attracting nearly 20 million visitors annually. The busiest tourisms run from April (when the cherry blossoms bloom) to September.
- In the District, there are approximately a total of 230 hotels, bread & breakfast inns, lodgings and vacation rental and more than 1200 hotels and restaurants. Food Wastes is the single -largest component of the waste stream by weight in the United States - Americans throw away about 43.6 million tons of food each year. The food waste includes uneaten food and food preparation leftovers from residences, commercial establishments such as restaurants, institutional sources like schools cafeterias, and industrial sources like factory lunch rooms.
- According to American Hotel and Motel Association (AHMA) 25-30% of the total waste stream generated by the hotel industry is food waste. Food waste typically consists of preparation waste, food trimmings, grease, off-the-plate discards, and surplus waste (food that cannot be sold to customers). Other waste materials include cardboard, which makes up approximately 25% of the waste, glass (4-6%), and aluminum and plastics (11-13% each). In most hospitality industries organic waste is the largest waste material. Kitchen is responsible for all organic wastes. As for organic wastes, kitchen can make arrangements to donate un-served food to local shelters or food banks.
- The quantity and the composition wastes generated by restaurants depending on the size of the restaurant, the type of the restaurant, and number of meal served. Restaurants with sit-down style dining, have nearly twice the proportion of food waste in their waste stream. Sit-down restaurants tend to prepare most menu items fresh and therefore have more preparation waste. Lettuce ends, egg shells, melon rinds, and garnishes are often found in the waste stream of these types of restaurants because the items are not already cleaned and prepared prior to being shipped to the restaurant.

Biogas was produced when cow manures with different solid content were used. The biological reactions of the different species in a single stage reactor can be in direct competition with each other. For this reason, biogas production under different conditions was not presented here. However, some preliminary conclusions were summarized:

- Low cost and low maintenance mini Anaerobic digesters were successfully built and used to produce biogas from raw manure and liquid manure.
- For all biogas samples produced by the mini digester, methane content ranges from 46.9% to 64.6%.
- Preliminary data shows that raw manures are better source for the mini digester to produce biogas than liquid manure (produce biogas faster with more methane content)

## Key Items of Evaluation