

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Human Health, Environment, Family, Youth, Society and Community

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	10%		8%	
702	Requirements and Function of Nutrients and Other Food Components	0%		4%	
703	Nutrition Education and Behavior	10%		3%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		8%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		5%	
721	Insects and Other Pests Affecting Humans	0%		2%	
723	Hazards to Human Health and Safety	5%		12%	
724	Healthy Lifestyle	20%		12%	
801	Individual and Family Resource Management	5%		0%	
802	Human Development and Family Well-Being	20%		10%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%		10%	
805	Community Institutions, Health, and Social Services	0%		18%	
806	Youth Development	30%		8%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	49.9	0.0	10.0	0.0

Actual Paid Professional	99.6	0.0	11.0	0.0
Actual Volunteer	117.3	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
4346439	0	1127714	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
4346439	0	1029669	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	4584783	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research programs to:

- Determine the relationship between family lifestyle factors, education, environmental influences and physical activity on general health and well-being, especially related to obesity, cancer, diabetes and chronic disease risk.
- Identify the nutritional determinants of allergic immune disorders.
- Increase understanding about how environmental pollutants, especially ozone and endocrine disruptors affect human health.
- Analyze the relationships among social support, public policy and family characteristics and how they affect the function and well-being of families.
- Increase understanding and develop more effective environmental management systems, practices and protocols related to natural and social systems.
- Develop better models for the human health and human services sectors.

Educational programs to:

- Teach how to choose healthful food, physically active lifestyles and behaviors consistent with dietary guidelines.
- Teach consumers to keep their food safe by offering programs on food safety, home food preservation and healthy, hygienic food-handling practices.
- Teach people living with chronic medical conditions to manage their condition effectively.
- Teach financial literacy and prepare individuals to manage their finances in anticipation of retirement.
- Teach caregivers and parents how to prepare children for school.
- Increase access to affordable, high-quality childcare.
- Prepare communities for the health care, housing and transportation needs of seniors.
- Educate citizens and public officials about funding methods, service provision and intergovernmental cooperation.
- Provide counties and municipalities with technical assistance related to intergovernmental contracting, consolidating services and financial and strategic planning.
- Assist government officials in leadership, conflict management, communication and engaging the

public in policy development.

- Prepare youth with knowledge and skills needed for life and employment.
- Enhance the physical, social, emotional and cognitive health and well-being of youth.

2. Brief description of the target audience

Michigan private citizens, state agencies, farmers, food processors, commodity groups and agricultural industry representatives are targets of research programs. Individuals of all ages and life stages are targeted for healthy lifestyle and food-safety education programs. Human development and family well-being programs target parents and caregivers of preschool children, people living with chronic medical conditions and senior citizens. Community institutions, health and social services programs target citizens and public/government officials. Youth age 9 to 18 are targets of youth development programs.

3. How was eXtension used?

eXtension was one of the major components in 2012 for multi-state and integrated activities. Members and contributors consisted of both AgBioResearch and Extension staff (119 people contributed in 2012). The public website had 68,139 site visits (a 28% increase) and 151,906 pageviews (a 15% increase) in 2012. The Ask an Expert component had 2,072 questions answered for Michigan residents with 252 questions answered by other state experts and Michigan answering 261 questions from other states.

Ask an Expert statistics were analyzed for our program areas and found for Human Health, Environment, Family, Youth, Society and Community there were 39 staff paid by formula funds (13 fte). A few examples were:

Question: I am concerned about the lack of a substantial "whoosh" of air when canned goods are opened. Now I learn that Ball, Kerr, and other lids are no longer made by the old companies. I have to question the safety of these new lids. For example, my canned applesauce has a discoloration in the top portion of the sauce. The lid appears to be sealed, but there is a minimum amount of air entering the jar upon opening. I have not become sick from these products, but I do discard that top portion. In the past I preferred the old Kerr lids, and I have canned for the over fifty years of my married life. I do prefer to can green beans, but most other foods can be frozen. Are others having problems with these lids?

Answer: It is wise to be concerned about the safety of canned goods, so I am glad you asked this question! Though you may not find the "whoosh" you are used to with canned goods, the lids have been found to be safe through tests, generally done by research-based institutions (like Universities). The discoloration on the top of your applesauce is not necessarily a sign of spoilage. Some ways to try and prevent this are to make sure all air bubbles are removed before sealing the jars, using the recommended headspace (1/2 inch for applesauce), and checking for minerals (like iron, copper, or zinc) in your cooking pot or in the water. About fifteen years ago there was a bit of a problem with canning lids, as some manufacturers changed their sealing compound. But I have not heard this general concern (about lids) since then. Thank you for contacting eXtension! And congratulations on your 50 years of married life and food preservation!

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	9328	27984	15012	30024

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

Patent Applications Submitted

Year: 2012
 Actual: 7

Patents listed

MICL01680 - Value-added Products for Improving Human, Animal and Plant Health - 61/598,843, 2/14/2012; 13/468,712, 5/10/2012; 13/460,781, 4/30/2012. MICL02017 - Evaluation Specificity and Structure/Function of Taxol Biosynthesis - PCT/US2012/042951, 6/18/2012. MICL02214 - Molecular mechanisms of Cytoplasmic Incompatibility in Mosquitoes - 61/625,881, 4/18/2012; 61/617.155, 3/29/2012 and PCT/US2012/029048, 3/14/2012.
 MICL02107 --

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	1	47	48

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research programs on human health, environment, family, youth, society and community.

Year	Actual
2012	44

Output #2

Output Measure

- Number of adult participants trained in healthy lifestyles.

Year	Actual
2012	4872

Output #3

Output Measure

- Number of youth participants trained in healthy lifestyles.

Year	Actual
2012	6823

Output #4

Output Measure

- Number of adult participants trained in human development and family well-being.

Year	Actual
2012	1499

Output #5

Output Measure

- Number of youth participants trained in human development and family well-being.

Year	Actual
2012	1809

Output #6

Output Measure

- Number of adult participants trained in youth development.

Year	Actual
2012	2130

Output #7

Output Measure

- Number of youth participants trained in youth development.

Year	Actual
2012	6380

Output #8

Output Measure

- Number of adult participants trained in family resource management.

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

2012

827

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of research programs to determine the relationship between family meals/lifestyle factors, education/food choices, general health and environmental influences, physical activity and general health.
2	Number of research programs to understand how environmental pollutants, especially ozone and endocrine disruptors, affect human health.
3	Number of research programs to develop better models for the human health and human services sector.
4	Number of adult participants with increased knowledge about healthy lifestyles.
5	Number of youth participants with increased knowledge about healthy lifestyles.
6	Number of adult participants with increased knowledge of human development and family well-being.
7	Number of youth participants with increased knowledge of human development and family well-being.
8	Number of adult participants with increased knowledge of youth development.
9	Number of youth participants with increased knowledge of youth development.
10	Number of research programs to develop more effective environmental/natural resources management systems.
11	Number of adult participants with increased knowledge of family resource management.
12	Number of research programs that study the function of nutrients and other components related to human health.

Outcome #1

1. Outcome Measures

Number of research programs to determine the relationship between family meals/lifestyle factors, education/food choices, general health and environmental influences, physical activity and general health.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Overweight people are at serious risk for cardiovascular disease, diabetes and some forms of cancer, and the risk is lifelong. The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity reports that overweight adolescents have a 70 percent chance of becoming overweight or obese adults, and this risk increases to 80 percent if a parent is overweight or obese. Further, obesity associated coronary heart disease is now the No. 1 cause of mortality in the United States. Parents can significantly improve the health of their children by initiating family lifestyle changes in activity and eating behavior.

What has been done

Research to: generate information to make it easier for citizens to eat healthier and be more physically active; determine the effects of food marketing on children's dietary behavior; determine the role of inflammation in the development of diabetic retinopathy; determine the role of diet, obesity and inflammation on colon cancer risk; determine the effect of calorie restriction on the body's innate immune response to influenza; and develop effective prevention and intervention methods for E. coli-related illnesses.

Results

A five-topic set of booklets, "Eat Healthy: Your Kids are Watching! A Parent's Guide to Raising a Healthy Eater," were produced. Twenty-four short video segments, which feature actual parents with their children talking about food in their homes, were created to accompany the booklets.

Research on diabetic retinopathy resulted in the discovery that the inflammation associated with retinopathy is the result of an autoinflammatory feedback cycle. Further, two proteins that enhance retinal inflammation were identified, creating the possibility of finding a way to keep

these two proteins from binding, ultimately creating a healthier environment for retina tissue and preventing blindness altogether.

Research on Shiga-producing E. coli (STEC) has demonstrated that bacterial cells can increase their toxicity through the use of biofilms. With this information, scientists are now working on mutant strains in an effort to prevent the bacterium from forming a biofilm, potentially decreasing the likelihood of more severe disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
802	Human Development and Family Well-Being
806	Youth Development

Outcome #2

1. Outcome Measures

Number of research programs to understand how environmental pollutants, especially ozone and endocrine disruptors, affect human health.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Michigan residents are exceptionally vulnerable due to chronic exposure to complex mixtures of endocrine disruptors that include legacy environmental contaminants within the Great Lakes basin (e.g., dioxin, PCBs, DDT), numerous pesticides and herbicides from the diverse and intense agricultural activities within the state, and the broad range of industrial activities that contribute to the overall pollution burden.

What has been done

Research to: comprehensively assess the toxicity of endocrine disruptors to determine the health risks of this contaminant to human health and wildlife in Michigan; study chronic respiratory diseases caused by air pollutants to better understand how nasal tissues and cells may respond

to inhaled toxicants; determine why some species of birds are more likely to support infectious agents than others; and to evaluate pesticide use and mitigate pesticide misuse to reduce environmental and human risk.

Results

Scientists studying a condition known as cardiometabolic syndrome (CMS), which increases the risks of cardiovascular disease and diabetes, found that mice fed a high-fructose diet (pervasive in today's human diet) begin showing CMS symptoms after a few weeks. When those same mice are exposed to air pollutants, they develop a condition known as insulin resistance, believed to be the underlying physiological cause of CMS, demonstrating a link between the health effects of CMS and air pollution.

Research performed in 2012 has further established that HIF1 and HIF2-mediated signaling (transcription factors that control, in part, the response to hypoxia) impacts asthma pathology and suggests that these HIFs may represent new asthma susceptibility factors that could lead to an efficacious means to prevent asthma in premature infants.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
805	Community Institutions, Health, and Social Services

Outcome #3

1. Outcome Measures

Number of research programs to develop better models for the human health and human services sector.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Healthy, vital communities with active citizenry are better equipped to address the challenges facing many of today's families. Whether the issue is economic development, youth aging, family

dynamics, demographics or rural and urban security, better models for the human health and human services sector are critical to human development and overall well-being.

What has been done

Research to: develop healthcare packaging that is easier to access, particularly for aging consumers and people with disabilities; develop models for preventive and early intervention strategies for children living with a family member with a serious illness; examine the relationship between the number of foster home placements for youth and the number of community connections as emancipated adults; examine the relationships between emotion-related socialization behaviors and infants', toddlers' and preschoolers self-regulation and social-emotional competencies; and to develop models and family-based interventions that advance the well-being of National Guard soldiers and their families post-deployment to a combat zone.

Results

Research on front-of-package (FOP) nutritional labeling has shown that a traffic light system to convey nutritional content shows great promise in consumer responsiveness and product understanding. These FOP systems display certain components of a product, such as sugar, fat and salt -- often associated with health conditions such as diabetes, heart disease and hypertension. Green lights suggest foods low in these components, while amber denotes moderate levels and red indicates high amounts. State-of-the-art technology is used to observe how people respond to the labeling. A similar system using different facial expressions (smiling, straight mouth, frown) is also being studied.

Research to help military families deal with stress shows that families that do best have strong support systems, the ability to communicate well in times of stress and anxiety, satisfying jobs and access to trusted external resources. Findings are also being used by policymakers at the local and national levels and in reintegration efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #4

1. Outcome Measures

Number of adult participants with increased knowledge about healthy lifestyles.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	4287

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

"The current lifestyles of most adults and children include too little physical activity and unhealthy diets. These two behaviors have contributed to the current epidemic of overweight and obesity in Michigan" (Healthy Michigan 2010, p.54) and places individuals at a greater risk for heart disease, diabetes, and other chronic diseases including cancer and arthritis. (Ogden et al., 2006; Ogden et al., 2008)

Michigan is a state continuing to struggle with high unemployment, high poverty rates and high obesity rates. While the national unemployment rate is at 9.8%, according to the October 2010 report from the Bureau of Labor Statistics, Michigan's unemployment rate remains slightly below 13%.

A point often overlooked is that many of those included in these statistics are new to poverty and may need significant assistance in navigating the food security system, as well as planning, preparing and budgeting low-cost meals. The loss of health insurance that accompanies unemployment makes disease prevention through good nutrition an even more important aspect of the EFNEP program in Michigan.

We also know that unemployment and under-employment is a factor in growing obesity rates. Michigan has the 10th highest rate of adult obesity (29.4%) and the 41st highest childhood obesity rate (12.4%) in the nation (CDC). A report in the American Journal of Clinical Nutrition (January, 2004) stated that the highest rates of obesity occur among groups with the highest poverty and the least education. Poverty and food insecurity are associated with lower food expenditures, low fruit and vegetable consumption, and lower-quality diets. Though spending a lower percent of income on food, Americans are consuming more sugars and fats contributing to the growing obesity rate.

What has been done

MSU Extension provides nutrition education in all 83 counties of Michigan through a variety of programs and funding sources (numbers here reflect approximately 10% of participants in this area). One example is Cooking Matters where the program empowers families at risk of hunger with the skills, knowledge and confidence to make healthy and affordable meals. With the help of volunteer culinary and MSU Extension nutrition staff, low income course participants learn how to select nutritious and low-cost ingredients and prepare them in ways that provide the best nourishment possible to their family.

Results

Findings from the evaluation of Cooking Matters found:

Positive change in Healthy Behaviors:

- 84% reported an improvement in the frequency of thinking about healthy food choices.
- 63% reported a decrease in the frequency of adding salt when preparing or eating foods.
- 91% reported an improvement in the frequency of using Nutrition Facts on the food label to make food choices.
- 38% reported an improvement in the frequency with which their families eat something within two hours of waking up.
- 74% reported an improvement in the frequency of eating at least 2 cups of fruits a day.
- 73% reported an improvement in the frequency of eating at least 2.5 cups of vegetables a day.
- 69% reported an improvement in the frequency of making meals that include at least 3 food groups.
- 65% reported an improvement in the frequency of getting at least 30 minutes of moderate physical activity each day.
- 50% reported an improvement in the frequency of cooking meals for their family instead of buying take-out or already prepared foods.

Change in food safety behaviors:

- 44% reported a decrease in the frequency of letting foods sit out for more than 2 hours.
- 35% reported a decrease in the frequency of thawing frozen foods by leaving them out at room temperature.

Change in Resource management behaviors:

- 78% reported an improvement in the frequency of planning meals ahead of time.
- 75% reported an improvement in the frequency of comparing prices before they buy food.
- 49% reported a decrease in the frequency of running out of food before they get money to buy more.
- 63% reported an improvement in the frequency of shopping with a grocery list.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Number of youth participants with increased knowledge about healthy lifestyles.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	6277

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity is a major contributor to chronic diseases, such as cardiovascular disease, cancer and diabetes. Michigan is currently ranked as the 10th most obese state in the U.S. In 2010, 31.7% of adults in Michigan were considered obese compared to 27.5% of U.S. adults. Clearly, focusing on early education to children and youth can make a significant difference on healthy eating and physical exercise.

What has been done

Show Me Nutrition is a comprehensive nutrition curriculum that teaches youths from preschool through junior high how to have a healthy lifestyle. The curriculum supports Missouri's Show Me Educational Standards (adapted from the National Health Standards) and supports grade level expectations for math and communication arts, where appropriate. Several important health themes are taught in each grade level, such as nutrition, food safety, physical activity, media influence and body image, and the grade levels are designed for continuity. Age-appropriate content, activities and handouts make learning about healthy eating fun for students at all grade levels. The preschool through fifth grade curricula include family newsletters that help family members and caregivers support learning at each grade level. Each curriculum includes handouts to reinforce lesson content with families and caregivers. During the last year the Curriculum has been updated and revised to reflect the 2010 Dietary Guidelines for Americans and to incorporate USDA's MyPlate.

Results

During the last fiscal year we reached nearly 52,395 children and youth in 82 of 83 counties in Michigan through one time presentations and a series of lessons. Note that only a portion was counted above due to funding lines. Males and females were equally reached in our programming in series. Nutrition education was offered based on child's developmental stage. Results of the MSU Extension program evaluation reflects that Show Me Nutrition is an effective

curriculum for improving children's knowledge and healthy behaviors. Results found:
School teachers reported that they have observed improvement in children's healthy behaviors:

88% reported children being more aware of the importance of healthy nutrition.

93% reported that children are more willing to try new foods.

86% reported that children improved hand washing.

59% reported that children increased physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
806	Youth Development

Outcome #6

1. Outcome Measures

Number of adult participants with increased knowledge of human development and family well-being.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1349

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Understanding the long-term value of academic success, leads one to study the factors that contribute to this state for children and youth. There are many different theories. The broad stroke factors that can affect school performance include socioeconomic status, parenting, amount of time spent with other children, quality and quantity of time spent away from primary caregivers, degree of physical and mental health, and effects of peer relations. Of course other factors such as presence of motivational teachers, parental expectations, reading at appropriate grade levels, and having their nutritional needs met may also be of influence.

Young children who are read to daily are more likely to develop emergent literacy skills; however, a 2007 report issued by the US Department of Health and Human services indicated that 16% of ages one to five were read to less than three days a week. Research shows that young children who develop emergent literacy skills prior to entering kindergarten are better prepared to learn to read and those children who are proficient readers by fourth grade. Furthermore youth who are not proficient readers by 4th grade are 68% more likely to drop out of high school and 5-8 times more likely to be incarcerated. A 2009 Annie E. Casey Foundation analysis of data from the NAEP found that 67% of all 4th grade students were below proficient in reading and 33% were below basic skill level and unfortunately 75% of students who are poor readers in 3rd grade will remain poor readers never overcoming that gap.

Noting that the literature review indicates the possession of basic life skills such as verbal and non-verbal communication skills, ability to work cooperatively, a sense of responsibility and respect, community involvement, decision making and problem solving are predictors not only of academic success but of success in the community and work force as well, preparing parents and other adults to help youth embrace those skills is an important step in growing Michigan's future by helping to prepare children and youth to thrive and contribute in a complex and changing world. Research conducted by the Search Institute indicates that youth that have a higher number of developmental assets are significantly more likely to succeed in school, value diversity and maintain good health. The study also found that youth with greater developmental assets are significantly less likely to use illegal drugs, be sexually active, or be either a victim or perpetrator of violence. (Search Institute, 1998).

What has been done

It is apparent that Michigan State University Extension can promote academic success by:

equipping parents and other adults significant in the lives of young children with the knowledge and skills preparing children to enter school socially, emotional and physically healthy and safe and ready to learn over their life span; helping youth to develop and practice life skills which will enable them to be successful academically and in future careers; and exposing youth to a variety of science experiences designed to enhance their science literacy.

The Michigan State University Extension Children & Youth Institute's Academic Success work group developed early childhood programs that work with both parents and children to improve academic success through improving parent-child interactions, better understanding of child development stages and needs, and helping the child to be ready for school. The goal of the program is for Michigan children and youth will demonstrate readiness for and engagement in K-12 education and possess the skills needed to be successful lifelong learners and ultimately a diverse population will be prepared to thrive and contribute in a complex and changing world.

Results

90.8% of the children were engaged in emergent literacy activities that prepared them for school.

92.6% of children were socially, emotional, and physically safe.

53.5% of participating adults indicated a change in knowledge regarding their ability to help young children 0-5 learn by using the protective factors survey.

95% of the adults increased their knowledge of how to prepare their children for school.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Number of youth participants with increased knowledge of human development and family well-being.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1628

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Several research studies, also supported by research conducted by the Search Institute, identified significant positive outcomes for youth who have developed life skills preparing them to be academically successful. These adolescents are more likely to delay participation in sexual activity (Schvanevelt, Miller & Berry, 2001); display higher self-esteem (Filozof, Albertin, & Jones, 1998); experience lower levels of depression and anxiety (Cicchetti & Toth, 1998, Liem, Dillion, & Gore, 2001); are less likely to abuse alcohol and to exhibit socially deviant behavior (Kasen, Cohen, & Brook, 1998); and are less likely to use and abuse substances (Hallfores et al., 2002).

What has been done

MSUE Programs in the Children and Youth Institute provide community-based, regional and statewide educational experiences to diverse audiences of children, youth, and the parents and adults that support them resulting in the development of assets that help children and youth thrive and contribute in a complex and changing world.

Results

Examples of evaluation results in life skills found:

97.7% of the youth gained the ability to apply the use of life skills gained through participation in 4-H.

90.1% of the youth applied life skills that they had learned in their daily lives.

98.4% of the youth valued and were engaged in cross-cultural experiences.

96.8% of the youth understood their own culture and the cultures of others.

99.5% of children were socially, emotional, and physically safe.

99.5% of the participating adults indicated the ability to apply life skills education into their youth development programs and activities.

99.5% of the adult participants could identify the connection between 4-H participation, life skills development, and academic success.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
802	Human Development and Family Well-Being
806	Youth Development

Outcome #8

1. Outcome Measures

Number of adult participants with increased knowledge of youth development.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1917

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2012, Michigan 4-H Youth Development involved more than 20,000 adults in providing fun, hands-on learning opportunities to more than 176,000 Michigan young people. 4-H also provided volunteer training opportunities to foster and support positive youth development. It is critical that volunteers have a strong knowledge of youth development.

What has been done

Trainings have been conducted to further develop adult volunteers' knowledge of youth development (especially new volunteers), as well as create safe environments for young people to learn, have fun and develop socially, and ensure that the adults we entrust to work with young people only have the best interests of youth at heart. The Michigan State University Extension Volunteer Selection Process is a tool used to recruit and orient volunteers who will be involved with young people for long-term, overnight or extended involvement. Adult volunteers is a tremendous asset to be cultivated, nurtured and utilized.

Results

Results of evaluations of approximately 528 adult volunteers found:

98.0% of the adults indicated the ability to apply life skills education into their youth development programs and activities.

92.3% of the adults indicated the ability to apply knowledge to engage youth in experiential, inquiry based science learning.

98.0% of the adults who increased their knowledge and skills in science content areas.

98.0% of the adults indicated increased confidence in their ability to engage youth in experiential, inquiry based science learning.

94.8% of the volunteers incorporated appropriate 4-H Guiding Principles into their programming.

94.3% of the adults that learned how to teach youth entrepreneurial concepts.

95.5% of the adults integrated financial literacy education into their programming.

98.7% of the adults supported youth in applying global and cultural competencies.

99.1% of the adults that gained understanding of youth global and cultural competencies.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Number of youth participants with increased knowledge of youth development.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	6061

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Michigan State University Extension Children and Youth Institute, through its 4-H program, strives to provide opportunities for youth (ages 5-19) to increase their leadership skills, build their cultural competencies, engage in the world around them as active citizens and learn that their voice and actions can make a difference. Our Vision Statement: Youth engage in making the world a better place. They utilize skills to lead in a globally interdependent and multicultural world. As citizens, they respond to shared local and global priorities through leadership, civic engagement and service. They understand and respect their own culture and the culture of others.

Leadership and Civic Engagement: A democracy is only as strong as the citizens that make it up and strength comes from having the knowledge, skills and attitudes to work for a common good. Research shows that changing demographics and lifestyle patterns diminish residents' willingness and ability to participate as leaders and volunteers. (Strengthening Michigan's Economy Report, 2007). Young people need leadership and citizenship education to be prepared to fully participate in society as adults (Strengthening Michigan's Economy Report, 2007, p. 23). Sixty-seven percent of Michigan residents surveyed indicate "helping youth develop leadership, citizenship and other life skills" is a high priority. Fifty-five percent indicate "involving youth and adults as active partners in decisions that affect the community" is a high priority. (Strengthening Michigan's Economy Report, 2007, p. 22). For more than a century, the 4-H program has engaged young people to strengthen decision-making, communication, teamwork, problem solving, and critical thinking skills. (National Citizenship Mission Mandate) Research confirms that 4-H members in grades 5-9 are more likely to make contributions in their communities than non 4-H members (Lerner et al, 2009). National 4-H Council defines the concepts and skills necessary for leadership to include communication, conflict management, decision-making, facilitation, planning, goal setting, problem solving, inclusion, diversity, and self-confidence (National 4-H Council, 2010). The Leadership and Civic Engagement work group has identified additional skills and concepts important to leadership including: character, creativity, citizenship,

and ethics.

What has been done

Trainings have been conducted to further develop youth leadership and civic engagement skills.

Results

Evaluation results from approximately 1512 youth found:

72.3% of the youth civically engaged as volunteers, decision makers, and community leaders.

97.8% of the youth that demonstrated the skills necessary for leadership.

72.3% of the youth engaged in authentic decision making partnerships.

98.0% of the youth gained knowledge and skills necessary for leadership.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Number of research programs to develop more effective environmental/natural resources management systems.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The need to develop economically and environmentally sound approaches to address environmental and natural resources challenges is increasingly important. Policies, practices and science-based knowledge must constantly evolve to promote stewardship and sustainability in light of new opportunities for increased productivity, resource-saving technologies and threats to biodiversity. Research is needed to ensure that practices and policies have a strong, science-based foundation.

What has been done

Research to: better understand community capacity in the management and decision making around natural resources, especially water and sanitation; better understand public benefits for policy development in recreation and tourism resource management; identify sustainable ways to enhance human well-being while reducing stresses on the environment; and to better understand the current spread, historical distribution and future disease risk of Lyme disease to inform effective citizen-focused information campaigns.

Results

A three-year intervention in two Flint, Mich., neighborhoods to improve their physical surroundings and measure the social impacts of landscape maintenance has resulted in an increase in membership in Code Red, a cell phone network neighborhood watch program, two successful community gatherings in one of the new common areas, and the reestablishment of the local baseball team.

Researchers focused on strengthening and sustaining Michigan's tourism industry were selected to prepare the 2012-2017 Michigan Tourism Strategic Plan. Preparation of the plan included the researcher's data, a series of industry surveys and 12, four-hour stakeholder workshops throughout the state (with a total participation in excess of 500 people). The plan has subsequently been approved and is being used to direct Michigan tourism industry over the next five years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
723	Hazards to Human Health and Safety
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

Outcome #11

1. Outcome Measures

Number of adult participants with increased knowledge of family resource management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	620

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The current national economic crisis in personal finance, housing and home foreclosure have placed unprecedented hardship on Michigan residents resulting in the need for personal financial education.

What has been done

MSUE developed and implemented programs to address financial literacy to improve the capability of Michigan residents to manage credit and financial resources and make financial decisions as well as reduce housing foreclosures and abandonment.

Results

Evaluation results for adults found:

- 65.1% of the participants kept track of spending and income by creating a personal budget.
- 68.6% of the participants saved money regularly by spending less than is earned.
- 68.2% of the participants obtained, reviewed and corrected personal credit report.
- 73.2% of the participants reported bills were paid on time.
- 61.6% of the participants paid down debt and adopted behavior changes that improved their credit score.
- 66.3% of the participants planned for retirement.
- 54.7% of the participants utilized a checklist for completing the steps in the home buying process.
- 54.7% of the participants calculated a reasonable housing cost based on the household budget.
- 58.3% of the participants decided to purchase a home.
- 34.0% of the participants reviewed and compared utility bills.
- 77.9% of the participants identified SMART financial goals.
- 74.7% of the participants increased their awareness of income, saving and spending through tracking.
- 70.4% of the participants learned to review all bills and/or financial institution statements for accuracy.
- 51.4% of the participants increased their knowledge of home ownership financial requirements.
- 46.6% of the participants increased their knowledge in predatory lending.

Evaluation of 100 Youth trained in financial literacy (not included in adult numbers above but new area for evaluation) found:

- 87.5% of the youth became financially literate.
- 84.8% of the youth applied sound financial practices.
- 78.3% of the youth increased their knowledge of financial concepts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development

Outcome #12

1. Outcome Measures

Number of research programs that study the function of nutrients and other components related to human health.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As we head into the second decade of the new millennium, paradigms of an unfolding nutrition transition in many countries; and uncontrolled obesity epidemic gripping America; global malnutrition; prolonged food insecurity in many low-income countries; and changes to prevent childhood stunting compel us to more fully understand the developmental (nutritional) origins of health and chronic disease that dominate the global public health nutrition agenda. By studying how individual food components are digested, absorbed, metabolized and utilized - and their effects on genes, cells and organs - the whole person can be understood. Deliberate manipulation of these food interactions can lead to improved health.

What has been done

Research to: identify more effective, efficient and greener, plant-based processes to produce pharmaceuticals; and to determine the effect of selected nutrients and food components on the development of allergic airway diseases.

Results

Research focused on nutritional determinants of allergic immune disorders has found that Vitamin E (in the form of γ T), in a rodent model, can protect from and reverse allergic inflammatory processes of the lung by inhibiting the enzyme COX2, which is a key inflammatory pathway. Scientists are also exploring a possible connection between γ T consumption during pregnancy and the incidence of allergic airway disease in children. Initial findings showed that pregnant mice

with deficient vitamin E had more pups with worse asthma. On the basis of these findings, researchers believe that setting a recommended daily amount of yT might be beneficial.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The ongoing economic challenges being faced by Michigan -- including the recent federal funding sequestration process -- continue to affect this planned program area. Consequences have included fewer new hires, delaying the award of new financial obligations, reducing levels of continued funding, and renegotiating or reducing the current scope of assistance through formula funds or block grants. Although overall research FTEs only decreased by one -- from 65 FTEs to 64 FTEs this past year, we are down from 77.1 FTEs just two years ago. Attrition and faculty departures also continue to have an impact on program outcomes.

We also opted in this year's annual reporting to revert back to our original 6 planned program areas for ease of reporting and better integration of research and Extension efforts. This has, once again, resulted in some instances in skewed results for some planned programs and outcome measures. This should be rectified after this year's reporting cycle.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

As Hatch dollars are base funding for faculty salaries, there is a built-in evaluation mechanism through annual reviews of overall performance, research productivity and the leveraging of additional research dollars. In addition, many of the research projects have an evaluative element that is required by state and federal-level funding sources that provides documentation related to project assumptions, goals and outcomes. This information is used to determine the overall success of research initiatives; their contribution to providing practical, real-world solutions and resources to address challenges and problems; and whether continuation funding and/or new dollars are appropriate and necessary as funds

are available.

That said, the most notable qualitative research impacts realized in this program were:

- Research evaluating the key contributing factors to diabetic retinopathy resulted in the discovery that the inflammation associated with retinopathy is the result of an autoinflammatory feedback cycle. Further, two proteins that enhance retinal inflammation were identified, creating the possibility of finding a way to keep these two proteins from binding, ultimately creating a healthier environment for retina tissue and potentially preventing blindness altogether.
- A three-year intervention in two Flint, Mich., neighborhoods to improve their physical surrounding and measure the social impacts of landscape maintenance has resulted in an increase in membership in Code Red, a cell phone network neighborhood watch program, two successful community gatherings in one of the new common areas, and the reestablishment of the local baseball team.
- A long-term evaluation of the best way to improve management frameworks for lakes has resulted in the development of an extensive multi-state terrestrial and freshwater landscape database. The 6-state, 2,300 lake database is unprecedented in size and will provide natural resource managers with a framework that more fully views lakes as complex systems coupled with human systems.
- A multi-year research project to evaluate water use and efficiencies, especially during drought conditions, has resulted in a revolutionary new water-saving membrane that dramatically increased corn and vegetable production on test farms. The subsurface water retention technology (SWRT) process uses contoured, engineered films, strategically placed at various depths below a plant's root zone to retain soil water. SWRT-improved irrigated sands produced 145 percent more cucumbers than did the control fields without water-saving membranes. Researchers also dramatically improved irrigated corn production, increasing yields 174 percent.

Other Examples Of MSUE Evaluation Results Not Previously Reported For This Area:

Social/Emotional Work Group from Health and Nutrition Institute

Summary of impact.

Issue (who cares and why)?

Caring for the social and emotional health* of young people - the social, mental, psychological and spiritual aspects of their well-being - is one of the most important contributions that adults who live with them, work with them or work on their behalf can make to their positive development. The social and emotional development of children and youth, as well as their healthy physical development, can be significantly compromised by the presence of violence in their lives. Included within the violence that affects young people is "youth violence," defined as the intentional use of physical force or power by one young person against another, and which can cause physical and psychological harm that spans a range of severity from murder, rape and assault to dating violence, bullying, verbal aggression and relational/psychological aggression (Haegerich & Dahlberg, 2011).

What has been done?

MSU Extension has an important role to play in addressing issues of adolescent aggression and violence through community-based education programs for adolescents and the adults who care for and work with them. The overarching goal of the efforts of the Social and Emotional Health area is for youth (and the adults in their lives) to learn to foster healthy relationships - and to live, learn and grow in safe, affirming, fair and inclusive environments free from violence, abuse, bullying and harassment. This will take place through educational opportunities with adolescents, parents and caregivers, and professional staff and volunteers in both nonformal educational settings (4-H, Boys and Girls Clubs, Scouts, Y's, afterschool programs, adjudicated youth groups, camps, faith-based groups, etc.) and in school settings.

Results/Impact? Evaluation of approximately 1,000 youth found:

- 70.2% of the youth improved their ability to respond to one's own social-emotional needs and the social-emotional needs of others
- 42.3% of the youth decreased involvement with unhealthy/abusive behaviors/relationships
- 55.6% of the youth learned about the impacts of healthy and unhealthy relationships on individuals and settings
- 49.0% gained knowledge about ways to foster safe and fair relationships and settings

Consumer Education Regarding Agriculture - Agriculture and Agriculture Business Institute (Evaluation of approximately 675 respondents from 2012)

Summary of impact.

Issue (who cares and why)?

Children and adults are farther removed from agriculture and knowing where their food comes from. They need to have a basic knowledge of agriculture and understand where their food comes from and that it is safe and nutritious for them. Educating consumers about modern agriculture and how farmers care for their animals, for the environment and how they produce safe and wholesome food is critical to helping them support Michigan agriculture.

What has been done?

Eight Breakfast on the Farm educational programs were conducted in 2012, A total of 21 programs have been held since Breakfast on the Farm started in 2009 and 40,865 people have participated in these events. In 2012 a total of 18,293 attendees participated. Participants were asked to complete a survey at the end of their tour.

Results/Impact?

This program was an integrated partnership with educators (field staff) and researchers (campus specialists) providing leadership for the evaluation component. The results found:

- 42.7% of the eleven-hundred and thirty-six 2012 BOTF participants who were surveyed on the dairy farms had not visited a working dairy farm prior to this visit, in at least the past 20 years.
- 90% agreed or strongly agreed that as a result of the BOTF visit their confidence in Michigan dairy products increased.
- 89% agreed or strongly agreed that the visit increased the likelihood that they will purchase Michigan dairy products.
- 85% agreed or strongly agreed that their trust in milk as a safe food increased.
- 89% agreed or strongly agreed that their trust in dairy farmers as a source of information about food production has increased.
- 90% stated they would talk to others about what they learned at Breakfast on the Farm
- At the completion of the farm visit there was a 20% increase in their trust that farmers will do the right thing in caring for their environment.
- At the completion of the farm visit there was a 20% increase in their trust that farmers will do the right thing in their treatment of food producing animals.
- At the completion of the farm visit there was a 17% increase in their trust that farmers will do the right thing to safe guard milk.
- At the completion of the farm visit where was a 20% increase in their trust that farmers will do the right thing in providing good housing for their animals.

Community Food Systems - Greening Michigan Institute's Community Prosp

Summary of impact.

Issue (who cares and why)?

The need for this program is based on:

"Residents of areas in all 83 Michigan counties, both urban and rural, have limited access to full service grocery stores and healthy food. Racial and ethnic minorities are particularly vulnerable to diet-related disease, and low income minority communities have been excluded from meaningful entrepreneurial and job opportunities in the food system. Youth obesity is increasing, and the life expectancy of the next generation is predicted to drop rather than rise. Every day people go hungry, and numbers of people without enough to eat have increased with Michigan's economic downturn." Source: Michigan Good Food Charter 2010.

Against these challenges, Michigan also has many assets including the second most diverse agriculture in the United States and abundant natural resources including being surrounded

by one-fifth of the world's fresh surface water, diverse and high quality soils, and increasing capacity for season-extension techniques in agriculture. Michigan also has capacity in available human capital that can be trained in occupations that support and contribute to the food system.

"Consumer demand for fresh, or minimally processed, healthy, farm-direct food is changing market conditions. Interest in home and community gardening has skyrocketed. Parents, students and community members are calling for farm-fresh foods in school cafeterias, and some school districts are responding to these demands. Likewise, institutions are finding ways to purchase from farmers in their region. A new cohort of young farmers is emerging in Michigan. Immigrants and farm workers have agricultural skills and knowledge and often a desire to start new farms. Michigan communities are embracing urban agriculture. Several recent legislative actions have supported these activities, and further actions could pave the way for more good food." Source: Michigan Good Food Charter 2010.

What has been done?

MSU Extension is uniquely qualified to address these challenges by mobilizing stakeholders and building upon these assets to catalyze change in Michigan's food system. The work group has worked at multiple levels that include farmers, businesses, retailers, government officials and consumers to improve community food systems.

Results/Impact?

From approximately 400 surveys, results found:

62.0% of the people reported an increased awareness of the connectedness of food, personal health, the environment and the economy.

69.7% of the people could describe what makes up a community-based food system, the importance of connectedness of the different sectors and food system issues.

44.6% of the people could describe that "good food" is healthy, green, fair, and affordable.

47.9% of the people increased their awareness of the Michigan Good Food Charter.

40.2% of the people increased their understanding of key food system terms such as food desert, food shed, food insecurity, food access, etc.

69.7% of the people were aspired to make changes in their food growing and consumption habits such as patronizing farmers' markets and growing/buying more local and regional food.

92.0% of the food council members that gain knowledge needed to effectively serve.

Key Items of Evaluation

Key research results include:

- The discovery that the inflammation associated with diabetic retinopathy is the result of an autoinflammatory feedback cycle. Further, two proteins that enhance retinal inflammation were also identified, creating the possibility of finding a way to keep these two proteins from binding, ultimately creating a healthier environment for retina tissue and potentially preventing blindness altogether.
- A three-year intervention in two Flint, Mich., neighborhoods to improve their physical surrounding and measure the social impacts of landscape maintenance has resulted in an increase in membership in Code Red, a cell phone network neighborhood watch program, two successful community gatherings in one of the new common areas, and the reestablishment of the local baseball team.
- Research focused on developing management frameworks for lakes has resulted in the development of an extensive multi-state terrestrial and freshwater landscape database. The 6-state, 2,300 lake database is unprecedented in size and will provide natural resource managers with a framework that more fully views lakes as complex systems coupled with human systems.
- MSU researchers dramatically increased corn and vegetable production on test farms using revolutionary new water-saving membranes. The subsurface water retention technology (SWRT) process uses contoured, engineered films, strategically placed at various depths below a plant's root zone to retain soil water. SWRT-improved irrigated sands produced 145 percent more cucumbers than did the control fields without water-saving membranes. Researchers also dramatically improved irrigated corn production, increasing yields 174 percent.

Results from MSUE Institute Workteams relevant to this area:

Agriculture and Agribusiness Institute

- Breakfast on the Farm educational programs had 18,293 attendees in 2012 (see specific impacts described above).

Children and Youth Institute

- 176,177 children/youth participated in 4-H in 2012 (see specific impacts described above)
- 7,091 pre-school children were readied for academic success
- 6,380 youth volunteers contributed to programming and experiential learning
- 20,340 adult volunteers contributed to programming and experiential learning

Health and Nutrition Institute

- 47,674 youth were trained in healthy lifestyles
- 47,313 adults were educated in nutrition and health
- 81 youth and 671 adults trained in Alternatives to Anger

Greening Michigan Institute

- 10 producers developed new strategies for local food production and distribution.
- 8,761 adult participants gained knowledge regarding community food systems
- 5,996 adult participants learned about sustaining community prosperity