

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Human nutrition, health, wellbeing and child 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
701	Nutrient Composition of Food			10%	10%
702	Requirements and Function of Nutrients and Other Food Components			5%	5%
703	Nutrition Education and Behavior			10%	10%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources			5%	5%
724	Healthy Lifestyle			25%	25%
802	Human Development and Family Well-Being			10%	10%
805	Community Institutions, Health, and Social Services			5%	5%
806	Youth Development			25%	25%
903	Communication, Education, and Information Delivery			5%	5%
	Total			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	12.0	10.0
Actual Paid Professional	0.0	0.0	12.0	10.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Institution Name: Auburn University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	600000	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	600000	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Alabama A&M University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	172712
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	172712
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

2. Institution Name: Tuskegee University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	753850
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	753850
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This research program was developed to include studies of molecular and cellular mechanisms of obesity, mapping of obesity-related traits in the genomes using animal models, surveys on lifestyle habits (food choice, exercise) of citizens, evaluation of underlying reasons for these habits, program development for improvement, and measuring adoption of improved diets and activity levels. Research activities also included exploration of non-traditional means of delivery of nutritive components. Research results was shared with extension personnel for further dissemination, particularly to county agents, consumers, and community leaders. Additional dissemination of results was through direct contact (such as survey participants and community gatherings), through publications (experiment station bulletins, on-line reports, press releases, as well as scientific journal articles). Specifically,

- Research has been conducted to address the causes of obesity. Among many factors, dietary behaviors that may promote overeating among different population segments was studied.
 - Research was conducted to document children's overall sleep organization (e.g., duration, time awake while in bed, number of times waking after initial sleep onset) and their performance during the daytime.
 - Research was conducted to study the relationship between quality of young children's relationships with caregivers and all aspects of their lives far into the future, from cognitive performance and friendships in preschool to psychological well being and physical health in late adulthood.
 - Research was conducted to study the relationship between Quality of Life among the Elderly Community and the Internet Technology Adoption
 - Seniors are increasingly finding the necessity to engage in Internet technology (e.g., online healthcare management, banking, shopping, and trading). Despite its usefulness, the adoption of the Internet among a large majority of the older population has been limited. Dr. Kwon's AAES research projects have allowed for discovery of the physical, cognitive, and social issues which lead to impediments in technology usability among older users. Further, Dr. Kwon and her collaborators have developed web-based interfaces incorporating innovative intelligent virtual agent technology that significantly reduces older users' physical, cognitive, and social barriers to Internet adoption. This research have significant implications for quality of life among the elderly community by fostering greater independence and empowerment, facilitating social interactions and communications, and bolstering self-efficacy and morale among seniors.
 - Research was conducted to Address Body Weight, Composition, Size and Shape. 3D Body Scan Technology was used in the Study of Obesity. Auburn researchers are currently working with the Chambers County School System to explore the use of an innovative technology which allows interface of body measurements captured by 3D whole body scanning with software to build 3D avatars with 9 year old 4th graders. Personalized morphing avatars are being used to study the impact of virtual visualization on maintaining healthy eating habits and increasing physical activity.
- Scientists are working with selected head-start programs in three counties to educate the teachers on food choices and exercise activities to reduce childhood obesity.

2. Brief description of the target audience

All state citizens, particularly targeted groups of children and high-risk citizens. Students (K through 12; college groups). Food producers and marketers.

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
Actual	50500	105000	5500	30000

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	10	75	85

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- publications

Year	Actual
2011	85

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Optimal nutritional recommendations made available to citizens
2	Public awareness of the relationship of healthy food and wellbeing and obesity
3	Reduction in obesity and overweight rate (66.6% in 2008) in population and children, and reduction of the level of obesity
4	health care cost will be lowered as a result of obesity reduction.

Outcome #1

1. Outcome Measures

Optimal nutritional recommendations made available to citizens

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Public awareness of the relationship of healthy food and wellbeing and obesity

2. Associated Institution Types

- 1862 Research
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	250000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Public need to be aware that their health, wellbeing and happiness are directly related with the food they consume. Improper consumption of food (quantities and quality as well as the manners of consumption) lead to obesity.

What has been done

Research has been conducted to address the causes of obesity. Among many factors, a dietary behavior that may promote overeating among different population segments was studied. Research was conducted to document children's overall sleep organization (e.g., duration, time awake while in bed, number of times waking after initial sleep onset) and their performance during the daytime.

Research was conducted to study the relationship between quality of young children's relationships with caregivers and all aspects of their lives far into the future, from cognitive performance and friendships in preschool to psychological well being and physical health in late adulthood.

Research was conducted to study the relationship between Quality of Life among the Elderly Community and the Internet Technology Adoption

Seniors are increasingly finding the necessity to engage in Internet technology (e.g., online healthcare management, banking, shopping, and trading). Despite its usefulness, the adoption of the Internet among a large majority of the older population has been limited. Dr. Kwon's AAES research projects have allowed for discovery of the physical, cognitive, and social issues which lead to impediments in technology usability among older users. Further, Dr. Kwon and her collaborators have developed web-based interfaces incorporating innovative intelligent virtual agent technology that significantly reduces older users' physical, cognitive, and social barriers to Internet adoption. This research has significant implications for quality of life among the elderly community by fostering greater independence and empowerment, facilitating social interactions and communications, and bolstering self-efficacy and morale among seniors.

Research was conducted to Address Body Weight, Composition, Size and Shape. 3D Body Scan Technology was used in the Study of Obesity. Auburn researchers are currently working with the Chambers County School System to explore the use of an innovative technology which allows interface of body measurements captured by 3D whole body scanning with software to build 3D avatars with 9 year old 4th graders. Personalized morphing avatars are being used to study the impact of virtual visualization on maintaining healthy eating habits and increasing physical activity.

Results

Associations between individuals' frequency of eating occasions (meals and snacks) and their total energy intake were found. The prevalence of obesity has been found to be especially high among those individuals with low-incomes and subsequently having a low-income is one of the most important determinants of food insecurity (the absence of access at all times to enough food for an active, healthy life).

Children in full-day preschool/daycare programs are (on average) suffering a sleep deficit during the work week (i.e., when they would be attending the child care program) and this deficit is not made up by daytime naps. Children's overall sleep organization (e.g., duration, time awake while in bed, number of times waking after initial sleep onset) are significantly correlated (that is, children with less optimal night time sleep tended to have less optimal daytime sleep as well). Importantly, sleep disturbances (either in duration or in overall sleep quality and organization) interfere with children's adaptive functioning in the preschool setting. Children whose sleep quality-sleep organization is disturbed at night were less able to organize story narratives in a coherent and meaningful way than were children whose night time sleep was less disturbed. Children who had less overall night time sleep received lower scores on standard tests of vocabulary knowledge, were less accepted by their peers, understood less about the causes of emotion states in others, and were described by their teachers as less well adjusted in the classroom, in comparison to children who had relatively more night time sleep.

Children who experience harsh or insensitive care are at greater risk for development of social, psychiatric, and physical health disorders. A key to understanding the long reach of early relationships appears to be activity of the stress-response systems, including the hypothalamic-pituitary-adrenal (HPA) axis and its primary end product in humans, cortisol. Poorer quality care in early childhood leads to dysregulation of the HPA axis, which in turn triggers a wide range of maladaptive processes. This work is likely to have high impact because the most salient sources of stress in the lives of young children are poor quality relationships with care givers. Decades of research document increased risk for children who grow up in persistent poverty or with harsh or insensitive parents, particularly if those adverse circumstances are present very early in the child's life. Only now, however, are researchers beginning to identify the biological processes that link early adversity to life-long health. Research linking parent-child and teacher-child relationships with key components of the stress response will be key in understanding of biochemistry and social success.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
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711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
724	Healthy Lifestyle
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
806	Youth Development
903	Communication, Education, and Information Delivery

Outcome #3

1. Outcome Measures

Reduction in obesity and overweight rate (66.6% in 2008) in population and children, and reduction of the level of obesity

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

health care cost will be lowered as a result of obesity reduction.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The economic down turn may have had a negative impact on human health, wellbeing, and happiness, which may have increased the level of obesity.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Research in this area has allowed a better understanding of the factors that influencing human health, wellbeing, and happiness. Other than nutrition, a number of social factors are also very important to child development and their eventual success. In particular, a number of studies have documented the impact of stress, child relationship with day care, sleep and other factors on success of the children.

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This research have significant implications for quality of life among the elderly community by fostering greater independence and empowerment, facilitating social interactions and communications, and bolstering self-efficacy and morale among seniors.

- Associations between individuals' frequency of eating occasions (meals and snacks) and their total energy intake was found. The prevalence of obesity has been found to be especially high among those individuals with low-incomes and subsequently having a low-income is one of the most important determinants of food insecurity (the absence of access at all times to enough food for an active, healthy life).
- Children in full-day preschool/daycare programs are (on average) suffering a sleep deficit during the work week (i.e., when they would be attending the child care program) and this deficit is not made up by daytime naps (El-Sheikh et al., in press). Children's overall sleep organization (e.g., duration, time awake while in bed, number of times waking after initial sleep onset) are significantly correlated (that is, children with less optimal night time sleep tended to have less optimal daytime sleep as well). Importantly, sleep disturbances (either in duration or in overall sleep quality and organization) interfere with children's adaptive functioning in the preschool setting. Children whose sleep quality-sleep organization is disturbed at night were less able to organize story narratives in a coherent and meaningful way than were children whose night time sleep was less disturbed. Children who had less overall night time sleep received lower scores on standard tests of vocabulary knowledge, were less accepted by their peers, understood less about the causes of emotion states in others, and were described by their teachers as less well adjusted in the classroom, in comparison to children who had relatively more night time sleep.
- Children who experience harsh or insensitive care are at greater risk for development of social, psychiatric, and physical health disorders. A key to understanding the long reach of early relationships appears to be activity of the stress-response systems, including the hypothalamic-pituitary-adrenal (HPA) axis and its primary end product in humans, cortisol. Poorer quality care in early childhood leads to dysregulation of the HPA axis, which in turn triggers a wide range of maladaptive processes. This work is likely to have high impact because the most salient sources of stress in the lives of young children are poor quality relationships with care givers. Decades of research document increased risk for children who grow up in persistent poverty or with harsh or insensitive parents, particularly if those adverse circumstances are present very early in the child's life. Only now, however, are researchers beginning to identify the biological processes that link early adversity to

life-long health. Research linking parent-child and teacher-child relationships with key components of the stress response will be key in understanding of biochemistry and social success.

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Key Items of Evaluation

- Research at Auburn in this program area has focused on the relationship of a number of factors affecting human health, wellbeing, and obesity. In particular, researchers have focused on eating habits such as individuals' frequency of eating occasions (meals and snacks) and their total energy intake, sleep patterns and health, stress and social development, and the adoption of the Internet communications with the happiness and wellbeing of the elderly. The following are some of the key findings:

- The prevalence of obesity has been found to be especially high among those individuals with low-incomes and subsequently having a low-income is one of the most important determinants of food insecurity (the absence of access at all times to enough food for an active, healthy life).

- Children in full-day preschool/daycare programs are (on average) suffering a sleep deficit during the work week (i.e., when they would be attending the child care program) and this deficit is not made up by daytime naps (El-Sheikh et al., in press). Children's overall sleep organization (e.g., duration, time awake while in bed, number of times waking after initial sleep onset) are significantly correlated (that is, children with less optimal night time sleep tended to have less optimal daytime sleep as well). Importantly, sleep disturbances (either in duration or in overall sleep quality and organization) interfere with children's adaptive functioning in the preschool setting. Children whose sleep quality-sleep organization is disturbed at night were less able to organize story narratives in a coherent and meaningful way than were children whose night time sleep was less disturbed. Children who had less overall night time sleep received lower scores on standard tests of vocabulary knowledge, were less accepted by their peers, understood less about the causes of emotion states in others, and were described by their teachers as less well adjusted in the classroom, in comparison to children who had relatively more night time sleep.

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