

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Childhood Obesity

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

| KA Code | Knowledge Area | %1862 Extension | %1890 Extension | %1862 Research | %1890 Research |
|---------|--|-----------------|-----------------|----------------|----------------|
| 305 | Animal Physiological Processes | | | 16% | |
| 701 | Nutrient Composition of Food | | | 4% | |
| 702 | Requirements and Function of Nutrients and Other Food Components | | | 42% | |
| 703 | Nutrition Education and Behavior | | | 20% | |
| 704 | Nutrition and Hunger in the Population | | | 10% | |
| 723 | Hazards to Human Health and Safety | | | 8% | |
| | Total | | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 0.0 | 0.0 | 0.4 | 0.0 |
| Actual Paid Professional | 0.0 | 0.0 | 2.1 | 0.0 |
| Actual Volunteer | 0.0 | 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 |
| 0 | 0 | 100572 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 0 | 0 | 71252 | 0 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 0 | 0 | 19378 | 0 |

V(D). Planned Program (Activity)

1. Brief description of the Activity

NHAES research covered a range of issues related to the US obesity epidemic, including discovery science, and developed interventions to improve weight and health.

2. Brief description of the target audience

This project is intended to benefit the health of people across New Hampshire, the region and country, while making the conduct of scientific research more transparent to community partners, stakeholders, and the public.

3. How was eXtension used?

eXtension was not used.

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 1105 | 1360 | 15 | 0 |

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | Extension | Research | Total |
|---------------|-----------|----------|-------|
| Actual | 0 | 10 | 10 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of undergraduate students directly involved in the projects

| Year | Actual |
|-------------|---------------|
| 2012 | 16 |

Output #2

Output Measure

- Number of university courses in which project results have been incorporated

| Year | Actual |
|-------------|---------------|
| 2012 | 8 |

Output #3

Output Measure

- Number of presentations at regional, national, or international scientific meetings

| Year | Actual |
|-------------|---------------|
| 2012 | 14 |

Output #4

Output Measure

- Number of surveys or other means of gathering information and data from participants

| Year | Actual |
|-------------|---------------|
| 2012 | 1 |

Output #5

Output Measure

- Number of reviewed, bulletin, popular and other publications

| Year | Actual |
|-------------|---------------|
| 2012 | 5 |

Output #6

Output Measure

- Number of graduate students directly involved in the research.

| Year | Actual |
|-------------|---------------|
|-------------|---------------|

2012

5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|--------|---|
| 1 | Number of graduate students trained and ready to enter the workforce. |
| 2 | Number of undergraduate students involved and trained in engagement research. |
| 3 | Increased knowledge about the role of PBDE flame retardant in obesity related metabolism. |
| 4 | Availability of methods for participatory research related to obesity. |
| 5 | Evaluation of effectiveness of health screening combined with nutrition education for worksite wellness program in small organizations. |

Outcome #1

1. Outcome Measures

Number of graduate students trained and ready to enter the workforce.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 1 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|----------------------------------|
| 305 | Animal Physiological Processes |
| 701 | Nutrient Composition of Food |
| 703 | Nutrition Education and Behavior |

Outcome #2

1. Outcome Measures

Number of undergraduate students involved and trained in engagement research.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 16 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Experiential learning opportunities reinforce classroom learning, and represent value-added education for which University of New Hampshire is known for.

What has been done

Sixteen students participated in research in four different labs. Many presented the results of their research at the annual college undergraduate research conference.

Results

These practical skills, and the work ethic that undergraduate research instills, enable these students to compete successfully for jobs and/or for entrance in top ranked graduate programs.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|--|
| 305 | Animal Physiological Processes |
| 702 | Requirements and Function of Nutrients and Other Food Components |
| 703 | Nutrition Education and Behavior |
| 704 | Nutrition and Hunger in the Population |
| 723 | Hazards to Human Health and Safety |

Outcome #3

1. Outcome Measures

Increased knowledge about the role of PBDE flame retardant in obesity related metabolism.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|------|--------|
| 2012 | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Flame retardants, including polybrominated biphenyl ethers (PDBEs), are now widespread in the environment. PDBEs have been proposed to function as obesogens, contributing to the obesity epidemic in the U.S. This project seeks to measure the impact of PBDEs on fat metabolism in a rat model, and to measure correlations between putative obesogens and fat accumulation in college students.

What has been done

- Rats were fed either corn oil (control) or with corn oil supplemented with PDBE at levels comparable to the level of environmental contaminants found in young adults. After 28 days, the amount of fat in the livers of both the treated and control rats was compared.
- The blood serum level of four classes of contaminants, dioxins, DDT, DDE, and PCBs was measured for 19 college students. For these same students, data were collected for a variety of health markers, including body mass index (BMI), serum triglycerides, and cholesterol.

Results

- In rats, exposure to PDBEs results in a 20% increase in liver fat, relative to control animals. This finding is consistent with the hypothesis that the flame retardant PDBE acts as an obesogen.
- College students were found to have significant levels of several environmental chemicals in their serum. However, contrary to our expectations, there was a statistically significant inverse relationship between serum PCB levels and triglycerides in these students. This finding needs to be investigated further.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|------------------------------------|
| 305 | Animal Physiological Processes |
| 723 | Hazards to Human Health and Safety |

Outcome #4

1. Outcome Measures

Availability of methods for participatory research related to obesity.

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)

Metabolic syndrome (MetS) is the name given to a cluster of associated health markers: elevated blood pressure, high fasting blood glucose, excess weight, low HDL cholesterol, and high triglycerides. MetS is correlated with increased risk for type II diabetes, stroke, and coronary artery disease. NHAES researchers are studying trends in young adult weight and biomarkers, and whether different interventions are successful in changing behavior or countering excess weight gain.

What has been done

- The College Health and Nutrition Assessment (CHANAS), which included 5,874 University of New Hampshire students, was analyzed. This assessment examines weight, blood pressure, abdominal obesity, and fasting blood glucose.
- NHAES researchers evaluated a ten-week, tailored, Internet-based intervention program, known as Young adult Eating and Active for Health (YEAH), developed to prevent excessive weight gain among 18 to 24-year-olds.
- A survey of college students was conducted to measure the impact of Guiding Stars (GS), a point of purchase consumer tool.
- Health assessment data was evaluated to determine whether body adiposity index (BAI) or body mass index (BMI) measurement methods more accurately reflect the total percentage of adiposity.

Results

- The College Health and Nutrition Assessment Survey (CHANAS) data suggest that rates of overweight and obesity have declined over the past eight years among young college age adults with a corresponding improvement in the proportion of students with MetS.
- The Young Adult Eating and Active for Health (YEAH) study findings suggest modest metabolic

improvements may be associated with web-based interventions that target healthy lifestyle behavior change among young adults.

-A survey of Guiding Stars (GS), a consumer tool for nutritional value at point of purchase, suggests that the presence of nutrition guidance positively influences students' perceptions that healthy foods are available.

-It was determined that the body adiposity index (BAI) more accurately reflects body fat percentage in college students than the commonly used body mass index (BMI) method.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--|
| 702 | Requirements and Function of Nutrients and Other Food Components |
| 703 | Nutrition Education and Behavior |

Outcome #5

1. Outcome Measures

Evaluation of effectiveness of health screening combined with nutrition education for worksite wellness program in small organizations.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|------|--------|
| 2012 | 0 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

-The U.S. obesity epidemic is associated with higher levels of inflammation, which may lead to heart attack and stroke.

-Experimental studies with laboratory animals suggest that increasing the ratio of omega 3 (anti-inflammatory) to omega six (inflammatory) fatty acids in diet decreases inflammation.

What has been done

A model of health screening and nutrition education for work-site wellness programs was tested with employees of NH Cooperative Extension over a two year period.

Results

Nutrition education intervention, related to the importance of benefits of omega-3/omega-6 fatty

acids, was found to be significantly correlated to changes in both weight and risk of inflammation that were measured periodically throughout the study.

The cost-effectiveness of the intervention was \$10.17 per percentage point reduction of low-density lipoprotein cholesterol and \$454.23 per point reduction coronary heart disease risk.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|--|
| 701 | Nutrient Composition of Food |
| 702 | Requirements and Function of Nutrients and Other Food Components |
| 703 | Nutrition Education and Behavior |

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes

Brief Explanation

Reductions in state appropriations to the University system and the NH Agricultural Experiment Station resulted in less support dollars for research, and hence a slow down in research activities.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The principal means of evaluation of activities in this planned program continue to be peer evaluation of project proposals and the acceptance of manuscripts for publication in peer-reviewed journals. Ten peer-reviewed papers were published from research projects in this planned program in FY2012, and nine presentations were used in professional meetings. By these criteria, all research projects in this planned program continue to be effective.

Key Items of Evaluation

Continued evaluation of the obesity problem in college age students shows a significant improvement over the last seven years: the rates of overweight/obesity have decreased by 25% and 40% respectively. This positive development suggests that various nutritional, educational, and behavioral interventions are having a positive impact on young adults.