

## Goal 3

### Key Theme – Human Nutrition

#### Wyoming

(Based primarily on one program and one research project: *Cent\$ible Nutrition Program* and *USDA Multi-State Research Project W-191: Factors influencing the intake of calcium-rich foods by adolescents*)

*CNP*: Educators helped clients learn to plan meals, make healthy food choices, provide breakfast to their children, read labels, and prepare foods without salt.

*USDA Multi-State Research Project W-191*: University of Wyoming co-principal investigators (food and nutrition specialist and 4-H youth specialist) on this 11-state project collaborated with county-based UWCES educators to pilot-test part of the survey to be used in the full study and then to pilot-test the complete survey.

Impact – The asthma research is in agreement with previous work that has demonstrated that approximately 50 percent of asthmatics will achieve a benefit by consuming relatively high levels of the omega 3 fatty acids found in fish and fish oil. Data from the asthma and omega 3 fatty acids research implies that there may be a non-pharmacologic means of controlling asthma if enough fish or fish products can be realistically consumed. Alternatively, that augmentation of the diet with small levels of encapsulated fish oil may ameliorate problems associated with asthma if the competing oils found at high levels in vegetable oils are also controlled. The inclusion of omega 3 fatty acids (also called n-3 polyunsaturated fatty acids or PUFA) in the diet overrides the potential deleterious effect of over consumption of vegetable oils high in n-6 PUFA as encouraged in an effort to reduce the incidence of heart disease. More importantly, this research indicates the relative importance of balance in the diet and how an imbalance can impact diseases such as asthma or a process normally not believed to be influenced by diet, ovulation, or may be involved in immune system regulation.

Ninety two percent of homemakers showed improvement in one or more nutrition practices. On entry surveys, 10 percent of participants demonstrated acceptable practices, in contrast to 39 percent on exit surveys. Dietary intakes improved in terms of protein, calcium, and vitamins A, C and B-6. Intakes of fats, oils, and sweets decreased. Sample success story: One client stated she never ate breakfast. She now eats something after she wakes up and makes sure her little girl eats something within 2 hours of waking.

The following results have been documented in 18 Wyoming counties. The total number of CNP participants in 2000 equaled 1,287. Ninety-one percent (1,167) were new to the program, representing a 41 percent increase over last year. There were 3,781 additional people in these participants' families. Eighty-three percent of the children in these families were under 12 years old. Seven hundred forty-six, or 58 percent, of the families were enrolled in one or more food assistance programs. Eighty-five percent of participants were female, and 91 percent were minority. Seventy-six percent participated in CNP group instruction. Sixty-three percent completed the entire program, with an additional 19 percent continuing to work toward completion.

Eighty-four percent of CNP participants showed improvement in one or more food resource management practices (26 percent demonstrated acceptable practices at entry, as compared with 53 percent at exit).

- 51 percent more often planned meals in advance
- 40 percent more often compared prices when shopping
- 46 percent less often ran out of food before the end of the month
- 46 percent more often used a grocery list when shopping

Ninety-one percent showed improvement in one or more nutrition practices (12 percent demonstrated acceptable practices at entry, compared with 40 percent at exit).

- 53 percent more often planned meals in advance
- 50 percent more often thought about healthy food choices when deciding what to eat
- 37 percent more often prepared foods without adding salt
- 64 percent more often used the Nutrition Facts on food labels
- 32 percent reported that their children ate breakfast more often

Sixty-four percent of clients showed improvement with food safety practices (63 percent of participants demonstrated acceptable practices at entry, compared with 87 percent at exit).

- 29 percent followed the recommended food safety and storage practices
- 55 percent followed the recommendation to thaw foods in the refrigerator, as opposed to thawing at room temperature

### **West Virginia Extension**

During the program year, 10/01/99 through 09/30/00, 805 individuals were enrolled, attended, and graduated from the Be Smart. Eat Smart program. Fifteen counties were involved in the program. One hundred percent of participants made at least one positive behavioral change in eating a healthy variety from the five food groups. Significant positive behavioral changes were noted in planning meals, comparing prices when shopping, using a grocery list when shopping, not leaving foods out of the refrigerator too long, eating healthy foods, using less salt, reading labels and eating breakfast.

### **Wisconsin Extension**

Two interactive educational displays (“Look What \$5 Can Buy” and “What Will \$5 Buy”) and a lesson plan were designed to help limited resource families understand how to buy more fruits and vegetables with their money. Twenty-seven Wisconsin Nutrition Education Program (WNEP) projects used the display or lesson plan from February, 1999 to September, 2000. A total of 225 clients participated in planned lessons while 8,068 viewed the displays.

After viewing the educational display, 7,129 of the participants were asked if the display had helped them learn how to get more fruits and vegetables for their money; 83.9% of respondents answered “yes.” 932 learners were asked if they would use one or more of the ideas from the display the next time they bought fruits and vegetables; 97.5% of those who responded to this question said “yes.”

-- The Washington County nutrition educator taught learners at several WIC sites using an educational lesson co-designed by WIC and WNEP. A pre-test found only 7% of the learners

were able to differentiate a whole grain from a refined grain food product. After the lesson, 93% of the participants said they were willing to choose whole grain foods more often, and 87% were able to correctly name two whole grain foods.

### **Washington Extension**

b. Impact: In 2000, 30,808 people participated in the Family Nutrition Education Program (45% adults and 55% youth). Each participant was reached at least three times by the program. The following practice changes were reported:

- \* Planned meals: 887 responses evaluated; 46% improved
- \* Used Food Pyramid to plan healthful meals: 424 evaluated; 59% improved.
- \* Ran out of food, food money or food stamps before the end of the month: 445 evaluated; 28% improved.
- \* Used a list when grocery shopping: 788 evaluated; 41% improved.
- \* Limited amount of salt in food preparation: 539 evaluated; 42% improved.
- \* Read food labels to choose more nutritious foods: 523 evaluated; 51% improved.
- \* Ate more than one kind of fruit and vegetable daily: 561 evaluated; 47% improved.
- \* Choose low fat foods: 339 evaluated; 54% improved.

### **Virginia Combined Research and Extension**

The VSU/ARS project, Therapeutic Potential of Soybean and Soybean Phytochemicals on Controlling Type II Diabetes Mell, began because there is convincing evidence that soy foods have beneficial effects on cardiovascular diseases (CVD) including atherosclerosis. This research attempts to answer if there are any benefits for the use of the purified soy protein or purified isoflavones pills (e.g. effects on CVD, hyperplasia, or ischemic heart). Preliminary data indicate that consuming whole soy or soy flour is more effective in reducing LDL, triglycerides, hyperplasia and increased HDL and elasticity of the arterial wall in animal models.

Virginia Cooperative Extension agents delivered seventy-one (71) programs to a total of 1,180 three- and four-year-olds on grains, fruits, and vegetables. Pre-tests and surveys indicated 10% of the participants were consuming the recommended servings of fruits, vegetables, and grains. After participating in the programs, 30% of the youth were consuming the recommended servings, thus indicating an increase in the number of youth consuming the recommended servings of fruits, vegetables, and grains.

### **Utah Combined Research and Extension**

**Brief Description:** Many ongoing Extension programs in Family Life contribute directly and indirectly to improving human nutrition. Basic food and nutrition information is delivered in a variety of methods and locations, providing new information and motivation to improve nutritional status in families. Of the agents in 28 Utah counties, 89% gave workshops, 28% gave seminars, 83% responded to individual inquiries, 50% used news releases, 67% used newsletters, 11% used radio, 17% used television, and 17% used internet.

**Impacts:** As a result of these activities, 56% of participants increased nutrition knowledge, 22%

improved diet consumed, 28% improved nutrition behaviors, 28% improved kitchen related techniques, 22% improved shopping decisions, 42% intend to change nutrition behaviors and 6% increased their food security. As a result of these activities 72% reported producing peer reviewed teaching materials, 84% of agents produced peer reviewed teaching materials, five activities produced refereed published materials, three agents published refereed materials and 2900 individuals completed non-formal nutrition education programs.

**Source of Funds:** Smith-Lever, State, County

**Impacts:** Multi-state Extension CO, ID, WY, MT, IO, KS, MI, NB, ND, SD

### **Utah Combined Research and Extension**

**Impacts:** From EFNEP

- \* Reached 1,376 families
- \* Taught 4,822 family members
- \* Taught 10,035 4-H youth at risk
- \* 56% of families were enrolled in one or more food assistance programs
- \* 90% of households were headed by females
- \* 52% of families were located in cities and suburbs over 50,000
- \* 48% of families were located in towns and rural areas
- \* 43% of families were at or below poverty level for income
- \* The number of regular daily servings of vegetables eaten changed from 2.0 to 2.7
- \* The number of calcium/dairy servings eaten changed from 1.7 to 2.3
- \* Money spent on food/person/month changed from \$76.80 to \$72.90
- \* 87% of homemakers showed improvement in one or more food resource management practices
- \* 94% of homemakers showed improvement in one or more nutrition practices
- \* 63% of homemakers showed improvement in one or more food safety practices

**Source of Funds:** Smith-Lever, State, County, Food Stamp Office via Utah Workforce Services

**Scope of Impact:** State specific - UT

### **Texas 1862 Research**

The maroon carrot is expected to bolster carrot sales and generate millions in revenue for seed companies and producers. Because of the carrot's sweetness, it's expected that more children will eat the maroon carrots--promotions are being planned using cartoon characters. The 'BetaKing' maroon carrot is being sold as 'BetaSweet' throughout the US, Canada and Australia.

Approximately 160 acres were grown in South Texas and Mexico this year. BetaSweet maroon carrot will impact the consumption & expand production as it is appealing to health conscious consumers as a good source of carotene & anthocyanins.

### **Texas 1862 Extension**

*Better Living for Texans* - The Better Living for Texans program is targeted towards food stamp recipients or individuals who are eligible to participate in the Food Stamp Program. During FY2000, the program was conducted in 165 counties across Texas with a total of 199,206 participants.

The core of the BLT program was a series of 5 to 6 lessons that focused on basic nutrition, food preparation, food resource management, and food safety. The curricula used in this program were research-based, targeted towards limited resource audiences, and available for county Extension agents. Educational exhibits, displayed in appropriate areas (i.e. food stamp offices, health departments, and grocery stores) also allowed limited resource consumers, who might not be able to participate in the lesson series, the ability to increase their knowledge of food and nutrition. Educational fact sheets and various media were also used to distribute information to limited resource audiences to extend/augment lessons.

Outcome data suggest an increase in the number of servings of fruits, vegetables, and dairy products. Participants also reported improvements in a number of behaviors that are in agreement with the Dietary Guidelines for Americans.

### **Tennessee Combined Research and Extension**

#### **Impact:**

Seventy-eight percent of those surveyed (n= 93,592) in the TNCEP Program reported they plan to adopt one or more dietary practices. Seventy-eight percent of participants in the Base nutrition program reported adopting one or more dietary practices. These practices included: Eating more whole grains, fruits and vegetables, decreasing intake of fat, sodium or sugar. Eighty-eight percent (n=3539) of program participants in EFNEP showed improvement in one or more of nutrition practices (planned meals, makes healthy choices, children eats breakfast more often).

Sixty-eight percent (29,341) of the TNCEP participants also reported they plan to share what they learn with others thus achieving a multiplying effect of program benefits to target clientele.

Based on research conducted at the University of Virginia, there is a considerable savings on health care dollars when individuals adopt healthy eating practices. They found that 10 dollars in health care costs are saved for every dollar spent on nutrition education.

#### **Funding Source:**

Smith-Lever, State (including Department of Human Resources Community Block Grant) and EFNEP (Smith-Lever 3d)

#### **Scope:**

State Specific

### **South Dakota Combined Research and Extension**

*Output:* The EFNEP program gives South Dakotans the nutrition information necessary to make healthy food choices. Psychological and socioeconomic factors present in South Dakota may influence food intake and nutritional status, and ultimately the health of the citizen. A

disproportionate burden of diet-related disease is born by minority, low-income, and educationally disadvantaged persons. CES has focused nutritional education on these groups.

*Outcome:* During this reporting period, 444 adults and 1905 youth between the ages of 6 and 18 participated in the EFNEP program. This program empowered participants to improve their diet and nutrition.

*Impact:* Of the 444 adults participating in the program, 33% reported improved food safety practices, while 40% improved their food selection and food preparation practices. Of the 1905 youth participants, 76% improved food safety and food preparation practices while 63% increased their knowledge of nutrition essentials.

### **South Carolina 1862 Extension**

Programs conducted through this effort include teaching the Food Guide Pyramid, Dietary Guidelines, teaching nutrition through teachers and other multipliers, and food preparation skill development.

1. Impact –

There were 391 programs presented which reached 8,293 consumers and multipliers. Of this total, 1,638 report they have adopted one or more of the Dietary Guidelines or are using a skill which will improve their nutritional status. Over \$23,000 in program support was generated. Using federal Food Stamp dollars, counties report reaching 3,163 adults through 187 nutrition education programs. Of this total, 2,820 report an increase in knowledge and 1,169 report developing or increasing a skill which improves their nutritional status.

2. Source of Federal Funds – Smith Lever 3b&c

3. Scope of Impact – State

### **Puerto Rico Extension**

A total of 2,577 persons completed non-formal nutrition education programs to improve their dietary habits in order to reduce the risk factors of chronic diseases: obesity, hypertension, blood cholesterol, blood sugar, low consumption of vegetables, fruit and whole grain products, and others.

Impact – Five hundred and eighty-five (585) persons adopted one or more recommended dietary habits six months after completing the short course.

Source of Federal Funds – Smith Lever 3(b), 3(c) Funds

Scope of Impact – State specific

### **Ohio Combined Research and Extension**

- a. **Description of Activity** - State Extension Specialists have reviewed and overseen the development of lessons and handouts to be used with specialized audiences (low

income parents of young children, and people receiving or eligible to receive food stamps), and have provided nutrition in-service training to the 70+ program assistants of the Food Stamp Nutrition Education Program and 65 nutrition educators with the Expanded Food and Nutrition Education Program. One or both of these programs are in over 70 of Ohio's 88 counties. Through the efforts of the Extension Specialists the para-professionals in these two programs had materials with which to collaborate with local institutions and organizations to reach the targeted clientele. Collaborating organizations included: penal institutions, senior citizens sites, community centers, youth organizations, mental health institutions, local school districts, health clinics, state department of health, local and state departments of human services, and service clubs.

- b. Impact** - Because of the nutrition updates provided by the State Specialists and the oversight they provided in the development of new nutrition education materials the nutrition educators with the Expanded Food and Nutrition Education Program were able to teach 7,456 parents of young children between October 1, 1999 and September 30, 2000. As a result of this teaching, 75 percent of the individuals taught made positive changes in their food intake, as measured with a pre/post-instruction recollection of food eaten in the previous 24 hours. Over the same time period the program assistants with the Food Stamp Nutrition Education Program reached 42,309 people using or eligible for food stamps. As reported under a separate nutrition theme, 70 percent of these individuals reported learning new information; 44 percent planned to implement changes, and 24 percent had already done so.
- c. Source of Federal Funds** - Smith-Lever 3b&c
- d. Scope of Impact** - State Specific

## **Nebraska Research**

### **Issue: (Who cares and why?)**

Omega-3 fatty acids can help reduce some heart disease risk factors, but many Americans don't get enough of these beneficial nutrients. A University of Nebraska scientist hopes her research helps change this situation.

### **What's been done?**

This NU Institute of Agriculture and Natural Resources researcher developed an entire poultry management system for economically producing eggs rich in omega-3 fatty acids. Flax seed, a significant source of omega-3 fatty acid, is a key feed ingredient in her patented Omega egg production system. The system provides good nutrition for hens, produces a consistent product and addresses food safety needs.

Each Omega egg produced using the NU system contains 350 milligrams of omega-3 fatty acids compared with 40 milligrams in conventional eggs. They're also lower in cholesterol. NU research show that eating up to two Omega eggs can reduce blood serum triglyceride levels 14 percent. High triglyceride levels are one risk factor for heart disease. Omega-3 fatty acids also have been shown to increase the ratio of good to bad cholesterol and reduce the occurrence of blood clots, another heart disease risk factor.

**Impact:**

The patented NU system makes Omega egg production more economical and efficient. That should lead to increased availability of the heart-healthy eggs for consumers. Commercial production of Omega eggs using the NU system began in early 2001 under a university agreement with a Midwestern grocery store supplier. The supplier distributes Omega eggs to a major supermarket chain in seven Plains and Midwest states, making them commercially available to consumers.

**Funding:**

NU Agricultural Research Division  
Hatch Act  
U.S. Flax Institute  
North Dakota Oil Seed Council

**Summary:**

Omega-3 fatty acids help reduce heart disease risk factors, but many Americans don't get enough of these beneficial nutrients. A University of Nebraska poultry scientist's research makes it more economical to produce eggs rich in these beneficial fatty acids. That, in turn, could make them more widely available to consumers. She developed a complete management system that egg producers can use to efficiently produce Omega eggs. The university patented her production system and has licensed it. One licensee is supplying Omega eggs to a major grocery chain in Nebraska and six other states.

**Nebraska Extension**

Local programs such as Food Stamp Nutrition Education and other nutrition education programs delivered to community groups, senior nutrition sites, schools, and youth programs reached 11,459 individuals on concepts related to increasing fruits and vegetables, decreasing sodium, eating a variety of foods, trimming the fat. Over 5,402 subscribers to a web newsletter receive information on nutrition and food preparation with 3,673 (68%) indicating they are saving the information for future use, and 2,215 (41%) reporting that the newsletter helps them increase their commitment to nutrition/food safety practices.

- d. Impact - cardiovascular health is not measurable at this point. The following adoption of dietary guidelines from participation in nutrition education programs has occurred:
- 190 graduates of the food stamp nutrition education program (52%) improved their overall nutrition practices and 310 (85%) improved in at least one nutrition practice.
  - Total fruit and vegetable purchases increased at five urban farmers' markets that reached approximately 1000 people. Followup qualitative information indicated that fruit and vegetable consumption increased.
  - Seventy-two students (74%) who completed a teen nutrition program taught through the schools increased the number of food groups they were eating, and were limiting the fat, salt and sugar in their diets.
  - 1,472 students (76%) participating in a TEAM Nutrition program changed their eating behaviors, increasing their consumption of vegetables, according to a two month follow-up plate study reported by school food service staff.

### c) Scope of Impact - State Specific

#### **North Dakota Combined Research and Extension**

Research shows that few children meet current recommendations for nutrition and exercise, and obesity among children is becoming a topic of increasing concern. Unfortunately, diet and exercise patterns set early in life are among those most difficult to break. The result may be an increased risk of some diseases and other health problems such as diabetes, cancer and heart disease.

Second graders in two North Dakota cities received education in a pilot nutrition, food safety and physical educational program using a new set of five lessons developed by the NDSU Extension Service. Extension agents trained the teacher on the curriculum and the teachers used the materials in their classrooms.

**Impact** - Educational efforts targeting children in North Dakota led by the NDSU Extension Service have included the development of a curriculum for second graders, the “Pyramid Players,” which includes five lessons based on the Food Guide Pyramid, food safety concepts and physical activity information and activities. These lessons were piloted in ten schools in two North Dakota cities before being released statewide in 1999. Other counties and schools have begun using the curriculum in classrooms and in after-school enrichment programs.

Nutrition knowledge scores of the 185 participants increased significantly from pre to post-test. In one of the cities, follow-up testing showed that 95 percent of the children brought the educational newsletters from the lessons home; 86 percent of the children reported trying new foods, 48 percent reported being more physically active and 42 percent reported eating more fruits and vegetables as a result of the five-week program. In the second city, 36 percent reported being physically active more often, 32 percent reported eating more fruits and vegetables, 60 percent reported trying new foods and 39 percent reported their families had tried at least one of the healthy recipes at home.

**Source of federal funds:** Smith-Lever

**Scope of Impact:** State Specific

#### **North Carolina Extension**

- a. The key teaching components include Worksite Wellness programs, health fairs, workshops and demonstrations, after-school programs, parent-teacher programs, and face-to-face encounters. Media is used to effectively disseminate a clear message about healthy eating patterns. Programs such as the Physician’s Project, Partners in Wellness and Out For Lunch help participants gain the needed knowledge and skills to adopt healthy dietary behaviors.
- a. Impact - Programs conducted by faculty and field faculty have resulted in positive knowledge and behavior change with respect to healthy eating. Education programs

addressing diet and health, were offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Multiple delivery strategies have been used and tested to ascertain the most appropriate means of reaching the population with meaningful nutrition messages. Programs with sustained impact continue across the state to provide support, information and skills to citizens as they continue to improve eating patterns.

#### Output Indicators

Numbers of participants increasing knowledge that will promote a healthier diet: 46,786

Numbers of participants increasing awareness of need to have good nutrition habits:  
56,080

Numbers of participants changing attitudes and aspirations that will promote a healthier diet: 33,648

#### Outcome Indicators

Number of participant's who adopt diets consistent with dietary guidelines for good health: 24,222

#### b. Scope of Impact - State specific

##### **North Carolina Extension**

- a. The key teaching points are training in nutrition for child-care providers, in-home study for parents and children, health fairs for parents and care-givers, one-on-one discussion with parents, and work in the classroom and child-care setting with children. Mass media is used to effectively disseminate nutrition messages to parents and child-care providers about the importance of helping children to form healthy eating habits early in life. Programs such as HomePlate, Be Active Kids, Out For Lunch and SyberShop (a multimedia CD-ROM for adolescents) help young people adopt healthy eating patterns for a lifetime of good health.
- b. Impact - Programs across North Carolina address the issue of nutrition for children by working with children, caregivers and parents. Multiple strategies have been employed to educate child-care providers and provide them with materials to use in the classroom as they teach young children about the importance of eating right for health. No one has more influence on the diet of young children than the parents. Field faculty work to provide parents with meaningful information about nutrition issues for their child as well as providing skills needed to carry out recommendations for good health. Several highly successful programs continue to expand to serve all North Carolinians with emphasis on underserved populations.

#### Output Indicators

Parents increase awareness and knowledge of importance of good nutrition for children:

3,124

Parents increase knowledge about good eating habits for children: 2,972

Parents and children participating in food and nutrition activities together: 3,939

Child care providers increase knowledge about the importance of good nutrition for children and the importance of teaching children about nutrition: 3,252

#### Outcome Indicators

Parents adopt food behaviors consistent with the Dietary Guidelines and the Food Guide Pyramid.: 3,031

Children adopt food behaviors consistent with the Dietary Guidelines and Food Guide Pyramid: 2,722

Child care providers teach children about the importance of a healthy diet based on the Dietary Guidelines and the Food Guide Pyramid: 3,252

- c. Scope of Impact - State specific

#### **North Carolina Extension**

- d. The key teaching components include neighborhood groups, preformed groups, one-on-one contacts, volunteers and use of the media. Programs such as the Expanded Food and Nutrition Program, Project Eat Right - Add to Life, Breastfeeding Program, Be Active Kids, Out For Lunch, and Partners In Wellness help limited resource audiences adopt behaviors that improve the nutrition adequacy of their diet.

- e. Impact - Many of the programs carried out in North Carolina give special emphasis to limited resource population. Faculty have secured over 11 million dollars in funds to specifically address this population and provide them with meaningful messages on food, nutrition, food safety and food security. Programs are in place that assist limited resource families in stretching their food dollar while being mindful of recommendations for good health. The program in North Carolina stretches across the lifecycle to include prenatal care, infant feeding, child nutrition, and nutrition for the elderly. Successful strategies for reaching limited resource audiences have been developed and tested and will continue and expand in the coming years.

#### Output Indicators

Numbers and percent who increase in knowledge of nutrition and diet: 27,681

Numbers of participants in programs such as Food Stamps, WIC free/reduced school meals who increased awareness which lead to improved health: 11,379

#### Outcome Indicators

Numbers and percent who made dietary improvement: 12,142

Numbers of pregnant women seeking prenatal care: 3,545  
Numbers adopting behaviors that reduce low-weight births: 2,461

c. Scope of Impact - State specific

**Montana Extension  
EFNEP**

**Brief Description:**

Extension professionals train and supervise paraprofessionals and volunteers who teach basic nutrition and food skills to limited resource families and youth via one-on-one home visits and/or group classes through an in-depth series of lessons. EFNEP works to achieve lasting improvements for families while promoting immediate changes in food habits. In the last year, Montana EFNEP is operating in four counties encompassing parts of three reservations: Big Horn, Blaine/Fort Belknap, Missoula, and Yellowstone.

**Impact/Accomplishments:**

In the adult program, over 92% of the participants improved their diets, in one or more areas of the Food Guide Pyramid. Utilizing the Behavior Checklist Survey, 77% of the adults who completed the program improved in one or more food resource management practices; 87% improved in one or more nutrition practices with their families; and 53% improved one or more food safety practices.

**Source of funding:**

Federal 3D  
Other grants

**Scope of impact:**

Five other rural states in collaboration

**Alabama Research Combined**

**“Statement:** Mushrooms have been used and respected for a long time in other countries for their uses in medicinal practices. They have also been known for their value as healthy foods that are low in calories, but high in other minerals, vitamins and vegetable proteins. A study at Alabama A&M University was done to analyze and compare the nutrient composition of shiitake mushrooms (*Lentinula edodes*) grown on sweetgum logs inoculated with two different shiitake mycelia/strains (WW44 and WR46), and to compare the nutrient composition of shiitake mushrooms harvested from sweetgum logs soaked in three different soaking solutions of nitrogen, sugar, and regular water. The mushrooms were grown at the Winfred Thomas Agricultural Research Station. Analysis was conducted on each sample for the content of the following nutrients: carbohydrates, crude fiber, protein, moisture, fat, ash, magnesium, calcium, zinc, potassium, phosphorous, chromium, iron, copper, and sodium. An analysis of variance was



Scope of Impact: Arkansas

**Connecticut Combined**

a. Activity - Connecticut has the highest per capita income in the nation but unfortunately the poverty rankings are just as high. For example, among 200 U.S. cities with more than 100,000 residents, Hartford ranks 6<sup>th</sup> in the percentage of children living in poverty (43.8 %). Poverty is correlated to the issue of hunger and homelessness.

The Expanded Food and Nutrition Education Program provided community outreach and nutrition education to low income families. Programs were provided in community locations and help to assess and improve food practices and behaviors through interactive education. EFNEP provided knowledge and skills that help families build on strengths and become independent and self-sufficient. Staff reached 682 EFNEP homemakers representing 2054 family members and 1099 children. 57% of the homemakers “graduated”, or completed 4 or more lessons and showed an improvement in diet or food-related behavior. In this population, the majority participated in USDA federal food assistance programs such as Food Stamps or WIC. 27% were Black, 27% White, 44% Hispanic, and 1% each Native American and Asian. 83% live in larger metropolitan areas. 64% had incomes at or below 75% of poverty. Over 2,200 youth were also reached 79% in urban/suburban areas. 39% were Black, 27% White, 33% Hispanic, and 1% Asian.

b. Impact - Evaluation of the diets of the adult homemakers before and after nutrition education showed an overall improvement by 94% of the participants. Results also show that participants were able to improve their diets while spending less money on food per capita per month. On average, families spent \$83.10 per person per month before participation, and \$73.80 after EFNEP intervention.

c. Source of Federal Funds - Smith-Lever 3 d (EFNEP)

d. Scope of Impact - State specific/CT

**Florida Combined**

**a. Brief Description of Activity: SMP FL511**

For FY 2000, thirty (30) counties actively participated in the Family Nutrition Program. The implementation of the Family Nutrition Program is done through one-time presentations, in-depth teaching, and social marketing. Each county program is unique to the needs of the community. FNP educational activities are presented to audiences in public schools, health department waiting areas, senior meal sites, health fairs, and public libraries, among others.

**b. Impact/Accomplishment Statement**

For FY 2000 there were 317,431 nutrition contacts through one-time presentations. One-time

program participants are asked to complete a five-question client satisfaction survey. Two-hundred and twenty-nine (229) of 230 participants completing the survey reported that the presentation met their needs. One-hundred and ninety-seven (197) participants reported that they plan on making dietary changes as a result of participating in this nutrition presentation.

Three-thousand, four-hundred and twenty-eight (3,428) individuals participated of in-depth programs in public schools, teen parenting programs, and senior programs. Three-thousand and ninety five (3,095) individuals completed pre- and post-tests.

- (a) 2,125 participants reported making improvements in their diets.
- (b) 378 demonstrated increase in knowledge by correctly identifying the food groups and accurately mentioning the number of servings recommended for each food group.
- (c) 912 participants reported improving food selection practices by increasing the use of a shopping list and meal planning.
- (d) 82 participants reported improving food budgeting practices.
- (e) 1,070 participants reported an increase in food safety knowledge and skills, especially in hand washing practices.

In the area of program marketing, 195,773 additional contacts were generated through food and nutrition articles in newspapers and newsletters. Twenty-one thousand, three hundred, and forty-four (21,344) additional contacts were generated through displays in WIC clinics, health department waiting areas, Food Stamp offices, county libraries, county schools, and county fairs.

*Isabel V—*

**c. Source of Federal Funds: Smith-Lever**

**d. Scope: State Specific**

### **Micronesia Combined**

Key Theme – Human Nutrition

a). Description of Program - A short-term program on Food and Nutrition was conducted in one state of Palau to assist individuals and families in acquiring the knowledge and skills necessary for healthy diets. Its focus was mainly on the basic tenets of variety, moderation, and balance and teaches its participants to plan their daily diet in accordance with the Food Guide Pyramid. The Food and Nutrition program consisted of ten series of lessons on Food Guide Pyramid, safe food handling and storing, meal planning, food preparation methods, and ten healthy and nutritious recipes.

b). Impacts/Accomplishments - Out of twenty (3 men and 17 women) participants, sixteen (84%) showed improvement in one or more nutrition practices (i.e., plans meals, makes healthy food choices, prepares foods without adding salt, reads nutrition labels or has children eat breakfast) and twelve (60%) showed improvement in one or more food resource management practices (i.e., plans meals, compares prices, does not run out of food or uses grocery lists).

c). Source of Federal Funds – Smith Lever

**Georgia Combined**

Extension provides diabetes education, weight management and general nutrition programs through home visits, group training, and media. During the past year, approximately 45,000 individuals were reached in 2,032 educational programs; 830,000 were reached by over 100 publications; and almost 30 million were reached by 1,120 radio and television presentations. County faculty attended 16 intensive training sessions in nutrition issues. The Family Nutrition Program reached 8,157 clients who completed a class series of 6 - 12 hours. A total of 220 class series were taught. In addition, 3,073 presentations were given to groups, reaching 76,235 individuals and one-on-one consultations reached 3,519 individuals. Over 57 million contacts were made through 476 TV programs, 3,117 radio presentations, 1,207 newspaper articles and 97 health Fairs. An additional 105,356 individuals were reached through 252 newsletter. 142 clients completed a home study series of 9 lessons. The Expanded Foods and Nutrition Education Program reached an additional 2,555 families and 13,189 youth. To increase the research and knowledge base available to human nutrition, the Foods and Nutrition department of the College of Family and Consumer Sciences received 39 grants, produced 118 refereed and popular publications, provided 58 meeting presentations, and conferred 12 graduate degrees.

**Impact**

After educational sessions in general nutrition, almost 60% of program participants indicated that they intended to adopt specific practices to lower fat in their diet and increase their intake of fruits, vegetables, and whole grain breads and cereals -- all practices directly related to positive heart and cancer prevention outcomes. Almost 80% indicated that they would start using the Food Guide Pyramid to plan balanced meals. Follow-up clinical and medical data on almost 400 Walk-A-Weigh (weight management) program participants showed that 59% had decreased both their weight and blood pressure and 72% had decreased at least 2 of 8 risk factors for chronic disease. Habit surveys indicated that they had also significantly increased their practice of 16 positive nutrition and health habits to reduce their risk factors. Follow-up habit surveys from the diabetes cooking school programs indicated that 65% of the participants had improved one or more behaviors to decrease the risk of chronic disease complications. As a result of EFNEP programs, 80% of the clients indicated that they had made improvements in food resource management, nutrition practices, and food safety.

**Source of Federal Funds** - Smith-Lever, USDA-EFNEP, USDA-Food Stamp Program (GA Dept. of Human Resources)

**Scope of Impact** - State Specific

**Iowa Combined**

“a. This past year, we worked with 4,573 food safety program participants including youth and adults; additional 17,699 individuals received food safety education through individual consultations. Over three hundred citizens served as volunteers in Extension food safety

programming. The field and campus specialists partner education on programs with the Iowa Department of Inspections and Appeals, the Iowa Hospitality Association, the Iowa Bureau of Food and Nutrition, local schools, hospitals, and community organizations, the Food Safety Consortium (Iowa, Kansas, Arkansas), WIC, food stamps, Head Start, Promise Jobs, and empowerment boards. ISUE partnered with Purdue University Extension to develop new educational materials about food safety for pregnant women and preschoolers. ISUE also partnered with the Iowa Department of Human Services to fund the Family Nutrition Program which incorporates food safety programming in its series of meetings with families. Field and campus specialists use resources developed by USDA, such as the FightBac materials, Partnership for Food Safety Education, and food safety web-sites, including the ISU Food Safety and Quality web-site at <http://www.extension.iastate.edu/foodsafety/>, FDA-CFSAN sites, [Foodsafety.gov](http://Foodsafety.gov), and others. Resources in biotechnology, irradiation, and HACCP are provided at a companion site maintained by the campus specialist to support food safety: <http://www.foodsafety.iastate.edu/>. Food safety rules and regulations specifically for Iowa have been developed with the State of Iowa and Iowa State University and posted at a web-site used by the Iowa food safety educators at <http://www.exnet.iastate.edu/Pages/families/hrim/publications.htm>). 264,000 consumers accessed 467,000 page views through the ISU Food Safety Web-site home page or one of its links, for a total of 2,744,880 hits last year. A presentation on biotechnology has been download over 300 times since its posting in a 3-month period. Over 38,000 consumers have accessed and completed one of the four interactive food safety lessons.

b. Impact -

d) 160 school food service managers responsible for 80,000 daily meals attended a sanitation certification program and planned to adopt six food safety practices. A four-month follow-up survey of class members documented that 80% of the managers (128 managers) had applied the knowledge gained and changed their food safety practices.

e) Three Child Nutrition Program Directors (school food service) successfully implemented HACCP procedures in their operations that serve 36,000,000 meals annually.

91% of 4,573 food safety program participants plan to adopt one or more recommended food handling practices (3,162 surveyed).

f) 99% of 400 individuals responding to follow up surveys (682 surveyed/403 responding) actually adopted one or more food handling practices following programs.

g) A study of the costs and benefits of Iowa EFNEP, completed in August 2000, showed that for every \$1 spent to deliver nutrition education in Iowa, \$10.75 is saved in future health care costs. The \$10.75 in health care savings occur because participants:

a) learn safe food handling practices, thus have fewer food-borne illnesses;

b) eat better during pregnancy, resulting in fewer low birthweight babies;

c) are more likely to breastfeed their babies, resulting in fewer childhood diseases;  
and

d) improve their overall diets, resulting in delay or prevention of chronic diseases.

- Three hundred forty-five (18%) graduates of the EFNEP program demonstrated acceptable practices in all three categories of behaviors taught (nutrition, food safety, and food resource management) at graduation from the program, as compared to only 55 (3%) at enrollment.

c. Source of Federal Funds - Smith-Lever 3b and c

- d. Scope of Impact - State Specific, however ISUE partnered with Purdue University Extension on food safety lessons. Also, the food safety and quality web site is accessed nationally and internationally.”

### **Idaho Extension**

A behavior checklist was administered to these individuals before (pre) and after (post) completing a series of nutrition classes. The results showed these 73-86% of adult participants showed improvement in one or more nutrition practices: i.e., planning meals, making healthy food choices, preparing foods without adding salt, reading nutrition labels or having children eat breakfast. When these nutrition practices are analyzed individually, the majority (>50%) of changes homemakers made included: planning meals in advance and using the “Nutrition Facts” on food labels to make food choices.

### **Indiana Extension**

*Description:* Limited resource families in both rural and urban settings require practical knowledge and skills to start them on the path to self-sufficiency. Families continue to be at risk due to limited resources despite employment.

*Outputs:* EFNEP utilized 44 (26 FTE) indigenous trained paraprofessionals (Family Nutrition Advisors) in FY 2000 to teach a series of food and nutrition topics, which led to behavior change of limited resource families in their home or community sites. Topics included food safety, meal planning, food resource management, selection and purchase of nutritious foods, and nutrition for pregnancy, lactation and early childhood. Lessons included food preparation skills, food budgeting skills and skills for feeding children. EFNEP collaborated with Workforce Development to present a series of lessons on food and nutrition skills, parenting and financial management skills to their clients. Collaborations also occurred with WIC, Food Stamps, Step Ahead, Healthy Families, Healthy Start, Head Start, Maternal and Child Health and local agencies such as food pantries, hospitals, and schools.

*Impact:* The EFNEP program in Indiana continues as it has for 31 years to make a difference in the lives of limited resource families. In FY 00, Indiana's EFNEP program reached 2414 families, representing over 8,410 persons with a series of food and nutrition lessons leading to behavior change. Over 15,700 lessons were taught and the majority of these families were taught over a 3-6 month period.

- 91% improved their intake of nutritious foods,
- 88% improved their nutrition practices such as making healthy food choices, preparing meals without added salt, children eating breakfast and reading nutrition labels,
- 82% improved their food resource management skills such as planning meals, comparing prices, not running out of food and using lists when shopping,
- improvement in food safety practices such as hand washing, thawing and storing foods properly was also determined,

- food costs were decreased by \$50-100 per month as stated by participants
- 2040 youth, ages 4-19 participated,
- 382 volunteers assisted in youth and adult program.

### **Louisiana 1890 Extension**

SUCEP Home Economists, Home Economist Aides, and five part-time Nutrition Program Assistants in 11 parishes, conducted the FF-NEWS program by providing nutrition information to persons receiving or eligible to receive food stamps. FF-NEWS is a nutrition intervention program designed to help with selection and preparation of meals consistent with cultural traditions while improving overall health. The FF-NEWS program has a curriculum that is divided into four modules totaling 56 lessons. The four modules are: Nutrition and Food Preferences, Health Status, Food Management Skills, and Food Quality and Safety. FF-NEWS has collaborated with various community programs including, Head Start, Urban Restoration Economic Corporation, Substance Abuse Rehabilitation Housing Facilities, Battered Women Shelters, Transitional/Homeless Family Centers, GED classes, YWCA, Council on Aging, local faith-based community organizations/churches, Food for Families/Seniors, and Commodity Food Supplemental distribution sites.

- b. Impact - More than 43,764 people have been reached through outreach efforts that include group or individual series of lessons and presentations. Preliminary data of 120 participants that have had a completed series of lessons, 60% stated that they used supplemental foods from WIC, Food for Families/Seniors, and Commodities more efficiently by utilizing recipes provided by the program. Of the 120 clientele, 80% now use a shopping list, 45% have their children assist them in food preparation and making healthy food choices and 25% utilize alternate seasonings and herbs to enhance flavor instead of salt and fat. Most of the participants indicated that they no longer leave soiled dishes in the sink overnight, have purchased appropriate food storage containers and follow suggested and approved storage practices. Late FY 2000, FF-NEWS placed nutrition information in five community papers/magazines in targeted FF-NEWS parishes. Approximately 18,000 limited resource families were reached (about 40% of total readers of community paper).
- c. Source of Funds - Smith-Lever Act 1444; USDA-FNS through the Louisiana Department of Social Services-Office of Family Support Food Stamp Program
- d. Scope of Impact - State-wide/Multi State
  - University of Arkansas- at Pine Bluff
  - Prairie View A&M University
  - Langston University
  - South Carolina State University
  - Lincoln University

The total cost for the program including salaries, fringe benefits, travel, and administration is approximately \$100,000 to benefit the citizens of Louisiana

## **Michigan Extension**

There are approximately 40,000 low-income families that live on or below the poverty level in Oakland County. These families lacked not only nutrition knowledge but also food shopping and preparation skills, food handling and food safety skills. Recruitment of diverse families that were eligible for the WIC program was targeted as well as services were provided in the housing projects. Collaborators included agencies that work with low-income audiences (i.e., Work First, Head Start, Health Department, OLHSA and others), WIC Project Fresh, Breastfeeding Recruitment/referrals, Oakland County Schools, Early Childhood Program, and Focus Hope Commodity Foods. The program used MSUE's curriculum, Eating Right Is Basic, for groups and individuals as well as provided hands-on food experience activities to move these families toward graduation.

## **Impact**

Fifty-four per cent of our families were enrolled from WIC. The FNP low-income program presented 18 programs for about 300 low-income senior citizens in various areas of the county. Worked with Oakland County Health Department to design a new referral system, the public health nurses requested this change. EFNEP teamed with WIC to distribute 880 coupons books to WIC and EFNEP recipients. There were 547 EFNEP families for the year in Oakland County. Seventy-five percent (75%) graduated from the program, with only 9% terminated from the program. Eighty five percent (85%) of the graduated homemakers made positive food behavior changes based on pre- and post- food recalls.

## **Source of Funds**

Smith-Lever 3b&c, Smith-Lever 3d, state, county, grant

## **Scope of Impact**

State

## **Key Theme - Food Resource Management**

### **Wisconsin Extension**

-- After a lesson on using food stamps and other programs to put together a food budget, 147 learners were asked if they had learned something that would make it easier for them to get enough food or Money for Food. Eighty-six percent (86%) of the respondents said “yes”.

- Following a lesson on wants and needs, 94% of the 46 participants could name a food “want” (as opposed to a “need”) that they would try to buy less often.
- After a practice activity on developing a family spending plan, 92% of the 119 learners reported that they intended to try to use a spending plan for their families.
- Following a teaching activity about food shopping strategies, 100% of the 50 participants said they planned to use at least one new way to get more for their food dollars.
- After playing a game on saving money when eating away from home, 92% of 26 participants said they had learned a new way to eat away from home occasionally without spending too much.
- After learning about choosing low cost foods based on the Food Guide Pyramid, 94% of the 150 participants could name a nutritious low cost food that they would buy for their family.

In four projects a series of lessons on managing family food dollars were offered to limited-income participants. Between 85 and 180 participants answered a set of questions before and after lessons taught over several weeks.

- Nearly half of the respondents reported improvement when asked about their typical use of recommended food shopping practices such as planning meals ahead of time (49% improved) and using a grocery list when shopping (41% improved).
- Approximately one-third of the respondents reported that they were more often comparing prices when buying food (32% improved) and using Nutrition Facts on food labels (38% improved).
- Half of the participants said that they were more often keeping track of their expenses (51% improved) and using a written spending plan or budget (48% improved).
- Nearly one-third of the participants reported their families were less frequently running out of food before the end of the month (an indicator of food security) after participating in the lessons.

## **Tennessee Combined Research and Extension**

### **Impact:**

Eighty-four percent of the participants in the EFNEP program showed improvement in one or more food resource management practices, including planning meals, comparing prices, and using a grocery list to shop for food.

Eighty-four percent of the TNCEP participants surveyed (5,124) reported they intend to plan meals before shopping, 72 percent (5,240) reported plans to shop from a list, 77 percent (1,039) reported they plan to develop a family budget to assure adequate expenditures for food, and 73 percent (5,124) plan to compare food items to get the best buy.

Consumers who use good food shopping practices are more likely to be able to secure a healthy diet and reduce dependency on society for support.

### **Funding Source:**

Smith-Lever, State (including Tennessee Department of Human Resources Community Block Grant) and EFNEP (Smith-Lever 3d)

### **Scope:**

State Specific

## **Key Theme - Human Health**

### **Washington Research**

Frequent consumption of common soy foods may be a risk factor for calcium oxalate kidney stones.

### **Washington Extension**

a. The Diabetes Awareness Education project began in 1999 in collaboration with Joslin Diabetes Center at Harvard University in Boston Massachusetts. The long-term goal of this project is to reduce the incidence of complications from diabetes. The specific objectives of the project are to: (1) increase knowledge about management of the diabetes; (2) increase knowledge about the medical tests used for early detection and treatment of diabetic complications; (3) increase understanding of the medical tests and (4) motivate program participants to seek regular medical assessment of their diabetes.

In FY 2000, in cooperation with Joslin, WSU project faculty outlined the educational process of the pilot program, and created the supporting materials for the program. These materials included: "Are You on the Road to Living Well with Diabetes", a booklet in English and English/Spanish (WSU arranged for the translations), a flipchart "Are you on the Road to Living Well with Diabetes" with English and Spanish scripts, all of the necessary human subjects releases and the questions to support the research effort. The WSU-Joslin team met three times in face-to-face meetings. Joslin drafted the initial booklet, WSU drafted the flipchart.

b. Impact: Participant numbers and impacts reflect the project's early phase of development. Faculty reported direct contact with 390 participants in educational workshops. Of those, 146 (37 percent) reported making changes in food preparation to accommodate diabetes. Programs were successful in reaching priority audiences, with 31 percent of all participants from African American and Native American communities.

### **Vermont Extension**

Older Vermonters with limited resources often suffer from ill health, which may be made worse by poor nutrition and unsafe food handling practices. UVM Extension's **Words to the Wise** newsletter helps elderly and homebound Meals on Wheels recipients eat well, safely, and affordably. The newsletter was distributed quarterly to 3,700 Vermont recipients of home-delivered meals. A reader survey showed 71% of respondents used information from Words to the Wise to eat healthier, and 63% used it to do a better job of keeping food safe. 66% of respondents used the information to increase their nutrition knowledge, and 65% used it to save money on food. Area Agencies on Aging reported that the newsletter helped clients eat well and stay healthy.

### **Virginia Combined Research and Extension**

Transgenic animals are efficient, cost-effective, and safe systems for obtaining complex therapeutic proteins that may be utilized for treatment of numerous life-threatening diseases in humans. The mammary gland has outstanding biosynthetic capabilities, and, for numerous reasons, pigs bio-engineered to express these products in their milk at lactation are the best

production models. Virginia Tech researchers have produced pigs that express several proteins of critical importance in the blood clotting and anti-clotting cascade, including human Protein C, Factor VIII, Factor IX, and fibrinogen, in their milk at lactation. This work has the long-range potential of producing human therapeutic proteins that are safe, efficacious, and available in ample quantity to fill a current void in supply. Availability of ample, cost-effective quantities of these products will potentially save human lives.

The "Change of Heart" home study course was offered throughout the Commonwealth of Virginia to approximately 3,000 people. A random sample evaluation of participants demonstrated significant changes: 76 % had increased their physical activity; 80% had increased their skills in reading labels; and 93% had improved their cooking methods to lower their intake of fat, saturated fat, and cholesterol.

Among 2,634 adults and 10,753 youth statewide, who completed at least six lessons in Virginia's Expanded Food and Nutrition Education Program (EFNEP) participant surveys provided the following impact data:

- 95% of homemakers made positive changes in at least one food group.
- Homemakers increased their intake of servings from certain groups of the Food Guide Pyramid by an average of 0.5 servings (e.g. Breads/Cereals/Pasta, Vegetables, Fruits, Milk/calcium foods).
- There were improvements on mean intake of nutrients as follows:
  - a. Fiber increased from 11 grams to 16 grams/day.
  - b. Calcium intake improved from 56% RDA to 75% RDA.
  - c. Iron, vitamins A, C, and B6 were below 70% RDA at entry, but increased to above 80% RDA at exit.
- 87% of homemakers improved in one or more food resource management practices such as (a) planning meals ahead of time, (b) using a grocery list, (c) comparing prices and checking Nutrition Facts on food labels to make food choices in the grocery store.
- 69% of homemakers improved one or more food safety practices, such as thawing frozen food properly, not leaving milk and meat-containing foods out of refrigerator for 2 hours or more, and washing their hands before touching food.
- 60% of homemakers began planning the use of household money to allow more funds for food and improved their menu planning and food buying practices
- 51% of households less often ran out of food before the end of the month or had to resort to eating less due to lack of money for food.
- 79% of youth indicated they were selecting nutritious, low-cost foods as a result of the lesson series.
- 75% of youth increased their knowledge of essentials of human nutrition.
- 75% gave responses indicating desirable food safety and food preparation practices.
- 70% indicated desirable practices related to eating a variety of foods and reducing intake of the Fats/Sweets Group.

Among 3000 adults and 2516 youth who completed at least six lessons in Virginia's Smart Choices Nutrition Education Program (SCNEP) participant surveys provided the following impact data:

- 92% of participants made positive change in at least one food group.
  - Participants increased their intake of servings from certain groups of the Food Guide Pyramid by an average of 0.5 servings (e.g. Breads/Cereals/Pasta, Vegetables, Fruits, Milk/Calcium foods).
  - There were improvements on mean intake of nutrients as follows:
    - a. Fiber increased from 11 grams to 14 grams/day.
    - b. Calcium intake improved from 50% RDA to 59% RDA.
    - c. Iron, vitamins A, C, and B6 were below 75% RDA at entry, but increased to above 75% RDA at exit.
      - 86% of adult participants showed improvement in at least one food resource management practice such as planning meals ahead, using a grocery list, comparing food prices and using the Nutrition Facts on food labels to make food choices in the grocery store.
      - 64% of adult participants showed improvement in one or more food safety practices, such as thawing frozen food safely (especially meat and milk products), and not leaving certain foods (milk, meats) out of the refrigerator for 2 hours or more.
      - 52% of adult participants began making a plan for use of household money to allow more funds for food and improved their meal planning and food buying skills.
      - 43% of households less often ran out of food before the end of the month or had to resort to eating less due to lack of money for food.
- 80% of youth gave responses indicating desirable food safety practices.
- 60% of youth showed improved nutrition practices such as eating a variety of foods and reducing intake of the Fats/Sweets Group.
- 60% indicated they were usually selecting nutritious low-cost foods.

### **Texas 1862 Extension**

A cancer exhibit in Lamb county helped save the life of a county employee who noticed a mole she had looked like a picture of a malignant melanoma she had seen on a skin cancer exhibit in the county agent's office; she went to her doctor who confirmed it was; because of this early stage discovery and treatment, the melanoma had not spread to other parts of the body.

### **Tennessee Combined Research and Extension**

#### **Title:**

Extension Women's Wellness Program

#### **Description:**

The University of Tennessee Agricultural Extension Service (UTAES) reached 17,781 women through wellness programs in 69 counties addressing self-care skills and personal action planning in four areas: health conditions unique to women, healthy lifestyles, disease prevention and management, and self-examinations and preventive screenings. Seven thousand women who were food stamp recipients or potential food stamp recipients participated in these programs. UTAES in 29 counties participated in 74 health fairs, reaching 21,611 Tennesseans.

**Impact:**

As a result of these programs, women who were surveyed reported the following:

- a. 7,850 increased their knowledge about health,
- b. 6,642 improved their attitudes about health,
- c. 6,549 planned to adopt recommended health practices by reducing health risk behaviors,
- d. 6,160 adopted recommended health practices by reducing health risk behaviors.

By empowering women with the knowledge, positive attitudes and self-care skills, Tennessee women can take personal responsibility for their health, prevent injuries and many debilitating diseases common to women, and reduce their personal health care costs associated with these diseases.

As a result of these programs, 5,241 women who were food stamp recipients or potential food stamp recipients reported they planned to adopt recommended health practices addressing physical activity, prevention and management of diet-related diseases, weight management, food and drug interactions and stress management. Through UTAES health programming, low income women are taking personal responsibility for their health, preventing injuries and many debilitating diseases common to low income women, and reducing personal health care costs.

**Funding Source:**

Smith-Lever, State (including Tennessee Department of Human Services Block Grant) and EFNEP (Smith-Lever 3d)

**Scope:**

State Specific

**Tennessee Combined Research and Extension****Title:**

Extension Men's Wellness Program

**Description:**

The University of Tennessee Agricultural Extension Service (UTAES) reached 7,327 men in 33 counties through health programs addressing self-care skills, healthy lifestyles, chronic disease prevention and management, and preventive screenings. Two thousand minority men participated in these programs.

**Impact:**

As a result of these programs, those men surveyed reported the following:

- a. 6,568 increased their knowledge about health,
- b. 6,514 improved their attitudes about health,
- c. 6,516 planned to adopt recommended health practices by reducing health risk behaviors
- d. 6,516 adopted recommended health practices by reducing health risk behaviors.

Through these health education programs, men are equipped to pay more attention to their health by developing self-care skills, engaging in healthy lifestyles, and receiving medical screenings

and treatments, leading to more healthy and productive lives during the transitional stages of manhood and reducing personal health care costs.

**Funding Source:**

Smith-Lever and State

**Scope:**

State Specific

**Tennessee Combined Research and Extension**

**Title:**

Extension Youth Wellness Program

**Description:**

Recognizing the important role schools play in the development of healthy lifestyles, the University of Tennessee Agricultural Extension Service (UTAES) provided health education to 77,789 youth in 48 counties in partnership with 6,018 schools and 2,612 teachers. Of the 80,753 youth reached, 14,023 were minority youth and 10,730 were children from families participating in the Food Stamp Program or who were potential food stamp recipients. Through 22 youth health fairs, UTAES in 15 counties reached 4,800 youth. Additionally, UTAES in 30 counties participated on 54 county health coalitions, targeting high risk health behaviors among youth in their communities.

**Impact:**

Through program surveys, youth reported the following:

- a. 24,326 increased their knowledge about health,
- b. 17,140 improved their attitudes about health compromising behaviors,
- c. 17,210 planned to adopt recommended health enhancing behaviors, and
- d. 5,329 adopted recommended health enhancing behaviors.

Through UTAES health education programs, youth are empowered with the knowledge, attitudes and skills necessary to engage in health enhancing behaviors.

**Funding Source:**

Smith-Lever, State (including Tennessee Department of Human Services Block Grant and EFNEP (Smith-Lever 3d)

**Scope:**

State Specific

**Tennessee Combined Research and Extension**

**Title:**

Extension Later Life Health Promotion Programming

**Description:**

The University of Tennessee Agricultural Extension Service (UTAES) health programs empower seniors to maintain their health through healthy lifestyle education such as exercise, diet, stress control and medications. Programs also address working wisely with the health care system, chronic disease management, self-examinations, vaccinations and preventive screenings. In 40 counties, 22,400 older adults were reached through UTAES health programs. Two thousand of these seniors were food stamp recipients or potential food stamp recipients. Three thousand minority seniors participated in these UTAES health programs.

**Impact:**

As a result of these programs, seniors reported the following:

- a. 13,469 increased their knowledge about health,
- b. 12,096 improved their attitudes about health practices,
- c. 12,235 planned to adopt health practices by reducing health risk behaviors
- d. 11,054 actually adopted recommended health practices.

Senior Tennesseans participating in Extension health education programs are now equipped with the necessary knowledge, attitudes and self-care skills to maintain their health and independence.

As a result of these programs, 2,000 seniors who were food stamp recipients or potential food stamp recipients reported they planned to adopt recommended health practices addressing physical activity, self-care skills for the prevention and management of diet-related diseases, weight control, food and drug interactions, and stress management. UTAES is assisting low-income seniors in developing the skills needed to maintain their health and independence.

**Funding Source:**

Smith-Lever and State (including Tennessee Department of Human Services Block Grant)

**Scope:**

State Specific

**South Dakota Combined Research and Extension**

“New Sperm Test Revolutionizes Human Infertility Treatment” (also relates to Goal 5)

*Brief description of the activity* – The sperm cell was the first cell ever observed under the light microscope by van Leeuwenhoek 330 years ago. For the past 50 years, scientists have focused on improving livestock genetics and helping infertile human couples. But they have been limited by technology. The microscope has been the basic tool of sperm research, limiting the scientists to sperm counts, motility and appearance; all assessments that are somewhat subjective.

South Dakota State University scientists have developed the Sperm Chromatin Structure Assay (SCSA). It is the first computerized, instrumentation-based test able to measure the genetic integrity of thousands of sperm cells in a sample in just seconds. The test also allows for faster detection of environmental heat stress and loss of sperm quality.

*Short impact statement* - The Sperm Chromatin Structure Assay (SCSA) is the only test in the world that is able to rapidly measure abnormalities that relate to defects in the paternal genes.

The test is included in the United Nations World Health Organization Manual, describing criteria for normal human fertility and techniques to assess fertility. The test has been established in laboratories around the world, including: Australia, New Zealand, Norway, Israel, Denmark, the Netherlands, and the Czech Republic.

“On the human side, a couple’s experience with infertility is a major emotional and psychological problem. Our best contribution is to analyze the husband’s sperm, and if it has defects that we can measure, we can likely spare the couple the expense of thousands of dollars on each attempt and the emotional expense of not achieving fertility,” said Dr. Don Evenson, a Distinguished Professor of Chemistry and Biochemistry at SDSU.

In addition, a study in the Czech Republic has documented that environmental air pollution has a negative effect on sperm. This study used the SCSA test to detect changes in the sperm chromatin structure in relation to the presence of high pollution levels.

Hatch Funds – USDA  
EPA  
National Institutes of Health  
March of Dimes  
State Funds

*Scope of impact, identifying which of the following apply to the activities conducted*

- (1) State Specific
- (3) Multi-State Research

### **Puerto Rico Extension**

Impact - Approximately 685 children and youth completed non-formal health education and promotion programs, 217 of them adopted one or more recommended practices after completing one or more of these programs. Also, around 345 youth and children participated in the Free for Life (NYNSPP). Of these, a total of 120 reported adopting one or more recommended practices after completing the programs.

A total of 3,824 adults completed non-formal education programs on topics related to health promotion and health education. Of these, 1,126 adults reported reducing their risk levels upon completion of one or more health education/promotion programs. The results between targeted and actual performance indicate a difference in more persons completing programs and accomplishing goals.

Around 279 persons participated in a non-formal educational program on the topic of risk reduction and safety; of these, 170 adopted recommended practices to reduce the level of home and traffic risks.

Source of Federal Funds – Smith Lever 3(b), 3(c) Funds

Scope of Impact – State specific

### **New York Combined Research and Extension**

#### **An Apple a Day Really May Keep the Doctor Away: Cornell Apple Findings a Boon to NY and US Apple Industry**

Many Americans turn to expensive dietary supplements in their quest to reduce their risks of chronic diseases, such as cancer and cardiovascular disease, as well as some of the functional declines associated with aging. Particular attention has been focused on anti-oxidant supplements like vitamin C, vitamin E and beta-carotene. While it has long been known that fruits and vegetables, such as apples, can provide anti-oxidant and health benefits, most research has focused on individual nutrients such as vitamin C, vitamin E, and beta-carotene. But clinical trials have shown that the individual antioxidants do not appear to have consistent preventive effects, so taking supplements like vitamin C pills or single-nutrient pills may not provide the same benefits that people can get from simply including fresh produce, like apples, in their diet.

Using apples as the source of these healthful plant substances, researchers in the College of Agriculture and Life Sciences at Cornell University found that a combination of substances in the fruit may be more effective at providing these health benefits than a single nutrient. They also found that these substances produce some powerful antioxidant activity and anti-cancer activity. In laboratory tests, it was determined that a combination of plant substances in apples- phytochemicals such as flavonoids and polyphenols- provide significant anti-oxidant and anti-cancer benefits beyond what single antioxidants such as vitamin C can provide. The antioxidant value of 100 g apple is equivalent to 1,500 mg of vitamin C. It was also found that the phytochemicals in apples inhibited the growth of colon cancer cells cultured in petri dishes and helped neutralize free-radicals that can damage the body's cells and genes. Comparing the anti-cancer activity of phytochemicals extracted from apple skin and apple flesh, it was found that apple skin inhibited colon cancer cell growth by 43 percent and apple flesh reduced cell growth by 29 percent. Tests on human liver cancer cells were even more effective, with apple skin inhibiting cell growth by 57 percent and apple flesh reducing growth by 40 percent.

From a scientific and human health standpoint, this research provides evidence that consumption of fruits and vegetables may play a significant role in reducing the risk of chronic diseases such as cancer. The findings also suggest that in order to improve their nutrition and health, consumers should be getting anti-oxidants from their diet, and not from expensive nutritional supplements that do not contain the important combination of phytochemicals found in fruits, vegetables, and other whole foods. In addition to the scientific impact, this research has a critical economic impact on NY State and US apple growers and apple industry, as the New York Apple Association plans concentrate much of their future marketing strategy around these findings. At a December 2000 board meeting, NY Apple Association president Jim Allen touted this effort as a "savior of the NY apple industry," which had been dealing with the effects of decreased demand and a 20 percent drop in wholesale prices over the past five years. According to the NY Apple Association, demand for apples has already risen following widespread publicity on the research, which was first published in "Nature" in June of 2000 and received international media

attention. New York's 674 apple growers produced 25 million bushels in 2000, with a value of \$135-million. Apple growers in other states are also cashing in on these findings, using this new information to promote their apples as well.

### **Nevada Combined Research and Extension**

In Nevada, more than 60 percent of hospital costs are attributable to negative lifestyle choices, including those that increase the risk of coronary heart disease (CHD) — the leading cause of death in the state. Nevada's Behavioral Risk Factor Survey showed that citizens are at high risk for CHD because of sedentary lifestyle (48 percent), cigarette smoking (30 percent), obesity (22 percent), high blood pressure (21 percent) and elevated cholesterol (20 percent), second highest in the U.S. Nationally, despite educational efforts, seven million Americans are affected by CHD, and 26 million workdays are lost annually due to the disease. Investigators at the University of Nevada armed with employee assessments collected over the past two years that included behavioral, physiological and psychological measures, developed an educational program specifically for the worksite. The goal of the program, entitled "Health at Work" (HAW), is to provide employees with skills necessary to reduce their risk for coronary heart disease. HAW uses a lesson-based approach taught by dietitians, exercise physiologists and social workers to promote healthful food choices, physical activity and stress management practices. Some of these include meal planning and preparation, eating away from home, principals of physical fitness, avoiding exercise-related injuries, progressive muscle relaxation and the importance of social support.

**IMPACT:** Significant improvement resulted among participants in their perceived ability to reduce their CHD risk. Nearly 90 percent of participating employees better understood their CHD risk. The classes and counseling resulted in significant reduction in dietary fat intake, and they were more physically active. More than 80 percent of participants said the program improved their ability to maintain healthy lifestyle changes. Anecdotal Impact: "This program probably saved my life!" said Charlyn Nishuichi, 45, accounts payable clerk in the No. Las Vegas Cashman store. Her blood pressure — which soared over 200 — was brought under control by referral to a doctor and medication. "I went from 250 to 195 pounds, eat a low-fat diet and exercise five days a week," said Chuck Denshire, 46-year-old service supervisor in Cashman's Sparks outlet. "It changed my life."

Source of Funds: Hatch

NAES State Funds

Smith-Lever & State Matching Funds

Scope of Impact: State Specific

### **Nevada Combined Research and Extension**

The experimental objectives of this project are twofold. One, to test whether short-term exposure to environmental tobacco smoke (ETS) results in oxidative DNA damage to mouse heart, liver or lung tissues. Secondly, to determine whether employees working in a smoking environment experience greater oxidative damage than employees working in a smoke-free

environment.

The first objective was to test whether short-term exposure to environmental tobacco smoke (ETS) resulted in oxidative DNA damage (formation of 8-hydroxy-2'-deoxyguanosine) to mouse heart, liver or lung tissues. The results from these studies showed that short-term exposure to ETS cause oxidative damage to nuclear DNA in lung, heart, and liver tissues of mice. Multiple exposures to the 30-minute ETS regime resulted in even greater oxidative DNA damage. This DNA damage has been identified in the etiology of a number of chronic diseases and is consistent with the number of chronic diseases associated with exposure to ETS. The second aim of this project was to test whether non-smokers exposed to ETS in the workplace had greater oxidative stress/damage than those non-smokers not exposed to ETS in the workplace and whether antioxidant supplementation could reduce any increased oxidative stress. Other criteria for inclusion in the study included not living with a smoker and not taking vitamin supplements. The non-smokers, workplace ETS exposed group, were subsequently supplemented with an over the counter antioxidant complex for 60 days and tests done to see whether this could reduce their oxidative stress/damage. Each of the two groups consisted of 37 individuals, men and women in approximately equal numbers. Two blood draws were conducted within 12 hours of the individual last work shift and analyzed for various markers of oxidative stress and ETS exposure. The results of these studies showed that the group exposed to ETS in the workplace did indeed have greater exposure to ETS (blood cotinine levels). This group also had increased antioxidant enzyme activities which suggest increased oxidative stress. Most significant however was the increase in oxidative DNA damage in the ETS exposed group in comparison to the non-exposed group. 8-hydroxy-2'-deoxyguanosine levels were 63% greater in the exposed group, thereby demonstrating a significant increase in oxidative DNA damage in this group. The ETS-exposed group was then provided with a 60-day supply of an antioxidant formula consisting of 3,000 mg of b-carotene, 60 mg of vitamin C, 30 I.U. of a-tocopherol, 40 mg of zinc, 40 mg of selenium and 2 mg of copper. After the 60-day supplementation, blood samplers were again drawn and the results were compared with the pre-supplementation values. A 62 % decrease in oxidative DNA damage was observed after supplementation. Lipid peroxidation as well as antioxidant enzyme activities were decrease as well. These results demonstrate that the use of antioxidant supplementation can help to lower at least some of the oxidative damage caused by exposure to ETS.

IMPACT: Environmental tobacco smoke (ETS) is an important indoor air pollutant that has been associated with increased risk of cancer and coronary heart disease. This is the first study to look at the effect of ETS exposure in the workplace and to provide evidence that antioxidant supplementation may be beneficial. Our research showed that employee exposed to ETS had a 63% increase in DNA damage over they non-exposed counterparts. Supplementation of antioxidant vitamins did prove to provide some measure of safeguard against ETS. Those who took the supplement saw a 62% decrease in DNA damage.

Source of Funds: Hatch  
NAES State Funds

Scope of Impact: State Specific

### **Nevada Combined Research and Extension**

Cooperative Extension developed An Ounce of Prevention, a diabetes prevention program targeting Hispanics, African Americans and Native Americans who are at an increased risk for developing the disease. Lessons in both English and Spanish help clients learn how to reduce their risk of diabetes by increasing physical activity and adopting healthy eating habits. More than 600 Las Vegas residents have completed the program. Additionally, this program was expanded through a train-the-trainer component. Community health representatives from Native American communities and volunteers from health committees from African American churches have been trained to deliver this program in their own communities.

**IMPACT:** Evaluation indicates that the diabetes program resulted in both knowledge gain and behavior change among participants. Recognition of factors that contribute to the development of diabetes was increased and a heightened awareness of lifestyle factors related to risk reduction (i.e. physical activity and energy intake) was documented. Participants increased their physical activity through walking and using stairs more often. They decreased their dietary fat intake by modifying food preparation techniques. By helping prevent diabetes in 600 clients, a medical savings of more than \$4.4 million was achieved. Finally, a total of 32 individuals have been trained to deliver the program.

Source of Funds: Smith-Lever & State Matching Funds

Scope of Impact: State Specific

### **New Jersey Combined Research and Extension**

**Activity:** Urinary tract infections are a problem that accounts for more than 7 million doctor visits annually. An estimated 40 percent of women will experience this problem at least once in their lifetime and often recurrent infections pose a significant health concern for women. The annual health care costs associated with this common and painful condition exceed \$1 billion. These infections are caused by bacteria adhering to the walls of the bladder and kidney. The bladder is routinely cleansed of bacteria through the elimination process, but an infection can develop if the bacteria adhere to the cell walls and multiply. While it had long been suspected that there was a connection between cranberry juice and urinary tract health, there was no clinical evidence to document the claim. Rutgers researchers set up a study to provide the clinical evidence that there was something specific to the cranberry that prevented bacteria from adhering to the lining of the bladder. The researchers isolated a compound in cranberries using a process called bioassay-directed fractionation.

**Impact:** The Rutgers researchers were successful in pinpointing why specific components in cranberry juice may be an effective strategy to help ward off or reduce symptoms of urinary tract infections. Their work helps confirm this anti-adherence theory and legitimizes the theory in the medical community. Their findings, which were published in the New England Journal of Medicine, could lead to the development of berries with a greater concentration of these compounds and eventually to medications that might prove useful as adjuncts to antibiotics. A

patent application has been submitted for this work

**Source of Funding:** CSREES Special Grant, State Funds, and Private Grant

**Scope of Impact:** State Specific

### **New Jersey Combined Research and Extension**

**Activity:** Osteoporosis is a serious condition in which bones become thin, brittle and easily broken. American women over age sixty-five have a 50% chance of suffering from osteoporosis; men a 20% chance. Broken bones can easily debilitate older women. In the United States, more than 250,000 hip fractures occur each year in persons age 65 and older. This disability can place heavy demands on the person with osteoporosis, his or her family and the health care system. Osteoporosis can be prevented or slowed by exercise, diet and frequently, by hormone replacement therapy. The Education Subcommittee of the Interagency Council on Sciences Education of which RCE is a member, planned an educational intervention to reach residents of New Jersey and increase awareness of osteoporosis prevention from adolescence to older adults. The subcommittee planned and implemented a mall-walk campaign called ***Strong Bones for a Lifetime***. This campaign targeted four malls across the state. There was a mass media event that preceded the campaign, several people received media training and participated in a media campaign to kick-off the event during the month of May, which is National Osteoporosis Month. Several of these trained professionals were interviewed by News-12 New Jersey and each of the interviews aired at least twelve times on Channel 12. Those who took part in the event at each mall had the opportunity to take advantage of several educational interventions: height and risk assessments, bone density video, osteoporosis video, educational literature, and samples of various types of milk and cookies. A medical expert and nutrition expert spoke at each mall event to provide current information to the participants. The highlight was a milk mustache contest, where the winner had their picture posted on a billboard on the NJ Turnpike for a month.

**Project Healthy Bones** a grant-funded forty four week program sponsored by the New Jersey Department of Health and Senior Services and delivered by Extension educators taught older women the importance of exercise, nutrition, and other lifestyle factors related to osteoporosis.

**Impact:** A follow-up survey was done for the Strong Bones for a Lifetime program. 462 surveys were sent out and 117 were returned. Participants stated that before the event they were familiar with:

- Osteoporosis as a disease (84%)
- Risk factors (62%)
- Prevention strategies (56%)
- Many were not familiar with diagnosis (46%) and treatment options (46%)

Participants also responded they plan to respond to the training session by:

- Changing my daily diet (72%)

- Beginning a weight bearing program (76%)
- Checking the home to make a safe environment (64%)
- Almost half stated that they would discuss osteoporosis with their doctors (49%)

An analysis of the Project Healthy Bones program revealed that all women began at Level I. After 28 weeks: 65% of the women have advanced to Level 3 (last level) of the “Balance Exercise.” Seventy-eight percent (78%) of the women have advanced from using no ankle weights in the first week to using nine-pound or more ankle weights for the leg exercises. Seventy-two percent (72%) have increased their hand weights from one pound in the first week to five pounds. As a result of their nutrition education, 100% of the women have increased their calcium and vitamin D consumption by the 28<sup>th</sup> week.

**Source of Funding:** Smith-Lever 3(b) & (c), State, County, and Private Funds

**Scope of Impact:** State Specific

### **New Jersey Combined Research and Extension**

**Key Themes:** Human Health

Human Nutrition

**Activity:** Soyfoods are becoming a popular nutrition choice for health-conscious consumers. The research is mounting that soy is protective against heart disease, some cancers, osteoporosis, and helpful in relieving the symptoms of menopause.

As soy continues to receive media attention and grows in popularity, Family and Consumer Science Educators responded to consumers' needs through a variety of program delivery methods: workshops, exhibits, taste-testing demonstrations, small group presentations, and consumer inquiries.

**Impact:** Workshop participants increased their knowledge, purchased more soy products, and used soy in family meals. After-class surveys of 271 participants documented a 91% increase in knowledge of the nutritional value of soyfoods and 95% learned how to use soyfoods in their daily diets. Of the 112 surveys returned (41% responding), 96% had purchased soyfoods; 76% had prepared soyfood dishes; and 76% now include soyfoods in their diets on a regular basis (daily or weekly).

**Source of Funding:** Smith-Lever 3(b) & (c), NJ Department of Agriculture, and Private Funds

**Scope of Impact:** State Specific

### **North Carolina Research**

Ovarian cancer is a deadly disease that kills more women than all other gynecological cancers combined. Each year in the United states, 27,000 to 28,000 women are diagnosed with the disease, and 16,000 to 17,000 women die from it. Despite progress made in treating cancers, most women who contract ovarian

cancer will die from it. The disease is not easily detected and is often discovered in an advanced stage. Researchers at North Carolina State University and Duke University have shown that egg-laying chickens may be used as a model for studying ovarian cancer. Ovarian cancer occurs naturally at a high rate in chickens. The epithelial, or surface, cells of chicken ovaries are similar to the epithelial cells of human ovaries and appear to respond to the hormone progesterin in the same way as human cells.

- e. Impact - Chickens are playing a role in medical research aimed at developing therapies for preventing a deadly human cancer and saving lives. Chickens have been used, for example, in research designed to evaluate the use of progestins, compounds like those found in birth control pills, and caloric restriction, to prevent ovarian cancer. Both methods were found to be effective in reducing the incidence of cancer.
- f. Sources of Funds - Hatch, State, Department of Defense, The National Cancer Institute, National Institutes of Health
- g. Scope of Impact - International

### **North Carolina Extension**

The key teaching include demonstrations/workshops, health fairs, video and audio tapes, home study kits, supermarket/farmer's market tours, and discussion groups and support groups. The mass media is used to effectively disseminate messages about the relationship between chronic disease and eating patterns. Programs such as Give Your Heart A Healthy Beat, Partners In Wellness, Out for Lunch, Be Active Kids and NoonLiting help participants adopt eating patterns that will decrease their risk of chronic disease.

- d. Impact - Programs across the state have facilitated a gain in knowledge concerning reducing risk for chronic disease, and over 24,000 changed diet and lifestyle habits, and improved their quality of life and the quality of life of others. Over 8,000 participants decreased dietary fat consumption, over 6,000 decreased dietary sodium consumption, over 8,000 increased fruit and vegetable consumption and over 4,000 increased dietary calcium consumption. As a result of the changed diet and lifestyles over 2000 decreased high blood cholesterol levels, over 900 decreased high blood glucose levels, over 2000 decreased high blood pressure levels, over 1300 decreased excess body weight. Programs that address knowledge, skills and positive behavior change continue to be successful in helping North Carolinians address risk factors related to heart disease, stroke, and certain forms of cancer.

#### Output Indicators

Numbers of participants who increase knowledge in how to reduce risk for chronic disease: 14,389

Numbers of participants who increase skills that will promote reducing risk of chronic disease: 11,596

Numbers of participants who change attitudes and or aspirations that will promote reducing risk of chronic disease: 10,377

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## Outcome Indicators

Number of individuals reducing risk factors for chronic diseases (heart diseases, strokes, cancers, adult-onset diabetes, arthritis, arteriosclerosis, and osteoporosis) including:

- Numbers who decrease high blood cholesterol level: 2057
- Numbers who decrease high blood pressure: 939
- Numbers who decrease high blood sugar: 2108
- Numbers who decrease excess weight : 1322
- Numbers who decrease fat in diet to below 30% of calories: 8590
- Numbers who decrease sodium in diet: 6181
- Numbers who increase fruits and vegetable consumption: 8764
- Numbers who increase calcium in diet: 4246
- Numbers who decrease dietary cholesterol to 300mg/day

c. Scope of Impact - State specific

## **Key Theme - Nutraceuticals**

**Activity:** University research is discovering that some foods, or extracts of foods, can play a specific role in preventing a disease or reducing an adverse health effect. However, scientific research is needed to verify health benefits. And once the health benefits are verified, the intellectual property needs to be transferred to business enterprises that can develop and market functional foods, or nutraceuticals, based on these proven health benefits.

We have studied the chemical components of noni fruit (*Morinda citrifolia*), a fruit typically found in the Hawaiian and Tahitian islands. The fruits have been used traditionally as a folk remedy for many diseases including diabetes, hypertension, and cancer. In this research, several new glycosides and iridoids identified in noni fruits were found to suppress UVB-induced AP-1 activity in cell cultures. This discovery may lead to the use of noni juice as a chemopreventive agent for humans. We have also worked together with a New Jersey based nutraceutical company to identify the chemopreventive compounds in boswellin. Boswellin is a methanol extract of the gum resin exudates of *Boswellia serrata*. Using cell culture as well as animal model, we have established that the major constituents of boswellin have anti-carcinogenic, anti-tumor and anti-hyperlipidemic activities.

A multidisciplinary team of Rutgers researchers was formed in collaboration with faculty at the University of Medicine and Dentistry of New Jersey, the University of Hawaii and New York's Strang Cancer Center to investigate the scientific basis of health-promoting foods. The team has developed a test that uses a specially prepared tissue culture to determine if a specific food has the ability to turn off a cancer-causing gene or, alternatively, turn on a gene that fights cancer. Different foods can be tested on copies of the same gene, allowing researchers to easily sift through many compounds to identify those that produce the desired effect. In December 1998, a spin-off company was incorporated to develop and market functional foods that had been identified through the Rutgers-developed testing process. Rutgers licensed this patented process to a spin-off company and is a major shareholder in the company.

**Impact:** Our research has helped at least one nutraceuticals company to develop new products with enriched bioactive compounds. In addition, using the patented process, the spin-off company has developed an extract of orange peel that can help prevent colon cancer. A human supplement based on the orange extract, mostly likely in pill form, is expected to be available next year. The extract works by suppressing a gene that, when activated, promotes cancer cell growth. In addition to orange peel, the company has also found cancer-fighting properties in grapes, Mexican bamboo, Vietnamese mint, licorice and black tea. The company is currently focusing on identifying additional products to prevent colon, prostate and breast cancer.

**Source of Funding:** State Funds, N.J. Commission on Science and Technology, and Private Grant

**Scope of Impact:** State Specific

**Michigan Research**

Accomplishment Statement: Preliminary studies indicate that cherry tissue, when added to ground beef patties will not only prevent lipid oxidation, but will also reduce the formation of heterocyclic aromatic amines. These compounds are very potent carcinogens. Approximately 20 compounds have been isolated and characterized from Montmorency and Balaton™ tart cherries. The anthocyanins and cyanidin isolated from tart cherries exhibited in vitro antioxidant and anti-inflammatory activities comparable to commercial products. The antioxidant activities of these compounds were comparable to those of commercial antioxidants (butylated hydroxytoluene and tert-butylhydroquinone) and superior to vitamin E at 2- $\mu$ M concentrations. Some of the anthocyanins have shown excellent anti-inflammatory activity in cyclooxygenase enzymes, COX-1 and COX-2, inhibitory of lipid oxidation. A novel process has been developed to capture the anti-inflammatory and antioxidant compounds in tart cherries in a "cherry pill" which can be marketed as a dietary supplement. MSU has negotiated a license agreement with a major corporation to develop and commercialize this product. At least five patents have been issued on this technology which has the potential to generate millions of dollars in net sales.

The ability of cherry anthocyanins and cyanidin to inhibit cyclooxygenases suggest that dietary intervention with anthocyanin-containing foods may have potential for prevention of colon cancer and other chronic diseases. Preliminary research data indicate that tart cherry anthocyanins reduced cecal adenoma numbers and sizes in Min mice. Further studies are in progress to provide a scientific basis for the notion that consumption of tart cherries has the potential to reduce the incidence of colon and other forms of cancers in humans.

## **Key Theme - Birth Weight**

### **New Hampshire Extension**

UNH Cooperative Extension developed a program called “The Great Beginnings Nutrition Curriculum for Pregnant and Parenting Teens.” Participation gives each teen the opportunity to realize the important role she plays in shaping her own health and her baby’s health and development. The curriculum consists of presentations, discussions and hands-on activities. Topics include healthy food choices, appropriate weight gain, breast versus bottle feeding, infant and toddler feeding, skillful shopping, and the role of snack and fast foods. It’s designed for teen parent groups, health education classes or wherever pregnant teens receive care. The short term goal provides practical nutrition and wellness information to adolescent mothers. Underweight infants are at a greater risk for many health implications. Long term goals are for healthier moms giving birth to healthier babies.

- a. Impact - This program reached more than 500 pregnant and parenting teens. Eighty-five percent learned more about nutrition specific to issues of pregnant and parenting teens and 87% planned on changing one or more behaviors. This program is funded by USDA Food and Nutrition Service and the NH Food Stamp Program. Funding has continued over the past 10 years, with many collaborators. A study was recently conducted to determine the link between nutrition education and birth outcomes of pregnant teens. The project was funded by USDA Economic Research Service and Food and Nutrition Service. It sought to answer this question: Can a nutrition intervention, such as “Great Beginnings” be successful at reducing the risks of pregnancy during adolescence, or is poor reproductive outcome in pregnant adolescents due solely to the biological immaturity of the young woman? The study design included 136 subjects in the NH Experimental group who received “Great Beginnings” and who were compared to three control groups. The first control group was comprised of 65 pregnant adolescents from Massachusetts who weren’t exposed to the curriculum. The second control group consisted of 50 non-pregnant high school students who received the “Great Beginnings” curriculum. The third control group was made up of 50 non-pregnant high school students who had no exposure to the “Great Beginnings” curriculum. The study revealed nutrition intervention reduced the risks of adolescent pregnancy. The low income, pregnant teenagers who completed “Great Beginnings” met or surpassed national standards for healthy childbearing. The five-year study of 136 expectant teens in New Hampshire demonstrated statistically significant increases in nutrition knowledge and diet quality, and statistically significant reductions in the incidence of low birth weight among teens who completed the six-week session “Great Beginnings” curriculum.
- b. Source of Funding - Smith-Lever 3c, State matching funds, grants
- c. Scope of Impact - Multistate Extension (NH, MA, RI)

## **Key Theme - Food Security**

### **North Dakota Combined Research and Extension**

The goal of food security is to help food stamp recipients have an adequate supply of food throughout the month. Food security issues were incorporated into a variety of educational topics presented by Nutrition Education Agents/Assistants (NEAs) at their nutrition education classes. Emphasized themes included increasing knowledge and/or use of food assistance programs provided in their community. Classes were offered at a variety of locations including the tribal commodity warehouses, food pantries, Headstart, County Social Services, or transitional living facilities.

**Impact** - Upon completion of FNP programming, 85 percent of respondents indicated they had enough food to eat throughout the month. In addition, 59 percent decreased the frequency with which they used emergency food assistance and 11 percent increased their use of available non-emergency food assistance programs including WIC, food stamps, school breakfast, and school lunch.

**Source of federal funds:** USDA Food Stamp Nutrition Education.

**Scope of Impact:** State Specific