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Wooster, OH 44691-4096

April 3, 2001

Mr. Barton Hewitt
CSREES/Partnerships
US Department of Agriculture
Stop 2214
Washington, DC 20250

Dear Mr. Hewitt:

We are enclosing the FY 2000 AREERA Report of Accomplishments and Results for the College of Food, Agricultural, and Environmental Sciences, including the Ohio Agricultural Research and Development Center and Ohio State University Extension.

If you have any questions, please contact for research: Steve Slack (330-263-3987), John Allred (614-292-3897) or Keith Smith (614-292-4880), Dave Williamson (614-292-5089).

Sincerely,

Steven A. Slack
Director, OARDC

Director, OSU Extension

Encl: FY 2000 AREERA Report of Accomplishments and Results (hardcopy)

cc: Bob Moser
John Allred
Dave Williamson

Federal Report of Accomplishments and Results (FY 2000)

The Ohio State University
College of Food, Agricultural, and Environmental Sciences
including
The Ohio Agricultural Research and Development Center
and
Ohio State University Extension

Goal 1. An Agricultural System that is Highly Competitive in the Global Economy

Executive Summary

Competitiveness in the today's global markets can be achieved only by innovative methods which produce products with enhanced value and with increased efficiency. Using the most modern techniques, such as biotechnology and precision farming, products are being produced more efficiently with less hazard to the environment. New methods of management have been adopted to make land that would be marginal for crops to be used more effectively in the production of beef. This has been of particular economic importance in Southern Ohio where family income has been depressed for several decades. The development of new products which are of value in niche markets such as high-oil corn or new varieties of tomatoes which have more of the physiologically active nutraceuticals and are disease resistant can be important in protecting farm income. Molecular biology has provided a means for not only detecting animal or plant diseases but also offer methods for their control and eradication. Finally, research to develop newer products on Ohio farms such as turf-grass and shrubs for the rapidly growing Green Industry helps to diversify farm income.

The discovery and development of these new products and methods of production require continued research, both basic and applied. We have learned that what is classified as basic research today will lead to applied research in a few years and then to routine farm production. Basic biochemical study of molecular biology from a few short decades ago laid the foundation for the most profound changes in plant and animal production and health that have occurred since the "green revolution." Because of space limitations, only a few of the literally hundreds of studies currently underway are summarized below but these give concrete examples of the types of research projects that are making a significant difference now and will make a profound difference in Ohio in the future.

Ohio's Commercial agriculture and horticulture industries depend upon Ohio State University Extension to provide timely and innovative, science-based, objective information that can be implemented within their management systems to remain competitive in our global economy. An innovative approach to problem solving, research and extension outreach is the use of empowered teams. A high priority for

The Ohio State University Extension is the development and coordination of commodity/issue focused teams consisting of State/District Extension specialists, County Agricul ture and Natural Resource agents and research faculty from multiple disciplines to deliver high impact, science -based information and educational programming that is timely and easily accessed by Ohio's diverse commercial agriculture and horticulture industries.

Ohio State University Extension and the Ohio Agricultural Research and Development Center have currently engaged 21 interdisciplinary self-directed teams ranging from our Swine Educators' Team to our Watershed Management Network. These faculty-led teams interact closely with respective state/national commodity organizations, state/federal agencies and environmental organizations to assist in developing our Extension led statewide programming and current communications structure.

Team electronic communications are the keys to access strategic information for global competitiveness. Many of our teams continue to develop weekly/monthly electronic newsletters and research updates that will be evaluated for their economic impact. Our team members develop newsletters following weekly tele-conferences such as: *Amazin' Graze, Buckeye Yard and Garden Line (BYGL), Crop Observation and Recommendation Network (CORN), Grain Marketing Research and Innovative Strategies (GRAINS), Pesticide Update (Pep-Talk), Pork Pointers, Veg-Net and Vineyard Vantage,* etc. Many newsletters are listed on our OSU Extension *Ohioline* web site, as well as many of our team's individual web sites for easier access by our stakeholders.

Goal 1 Key Themes

1. Key Theme: Agricultural Communications/Information Technologies

(Reference OSU Plan of Work Program 1A: Summary of Extension Programs)

a. **Description of Activity** - Team electronic newsletters and fact sheets/bulletins through appropriate e-mail list serves and Web sites have been identified by Ohio clientele as preferred option to more traditional extension educational meetings. Many of OSU Extension's commodity-focused teams provided weekly/monthly electronic newsletters and research updates which have been evaluated for their economic impact. OSU Extension team members developed educational newsletter summaries following weekly tele-conferences titled: *Amazin' Graze, Buckeye Yard and Garden Line (BYGL), Crop Observation and Recommendation Network (CORN), Grain Marketing Research and Innovative Strategies (GRAINS), Pesticide Update (PEP TALK), Pork Pointers, Vet-Net, Vineyard Vantage* and the Watershed Network's *Buckeye Basins*. We have listed all newsletters on our OSU Extension *Ohioline* Web site, as well as many of our team's individual Web sites for easier access by our stakeholders/producer clientele.

b. Impact - Newsletter surveys have indicated that agronomic crop producers saved over $4.5 million dollars in chemicals used from implementing management practices

presented in the *CORN* newsletter and over $1.5 million from utilizing marketing tips found in our *GRAINS* newsletter. The OSU Extension beef team Web site, released in May 1997, had more than 6,200 hits during May, 2000. Recently, the Web site was named the number 1 Web site for livestock information by a public opinion survey conducted in Spring, 2000. The *Buckeye Yard and Garden Line (BYGL)*, started in 1990, continues to be a key electronic educational tool developed by the OSU Extension Nursery Landscape and Turf Team for county Extension offices, the commercial green industry, and the gardening public. In the 2000 *BYGL* Evaluation Survey, 185 respondents indicated that *BYGL* saved their businesses over $115,000. Over 46% of the respondents indicated that the *BYGL* changed their pest management practices. Through newsletters, media and other sources, respondents indicated that *BYGL* reached over 600,000 people in 2000. *Buckeye Yard and Garden onLine*, the web version of *BYGL* averaged over 5,000 hits per month during the growing season. This version of *BYGL* is linked to thousands of plant and plant pest images and over 23,000 fact sheets from throughout the U.S. via links to the OSU Horticulture and Crop Science in *Virtual Perspective* Web site. In addition, *BYGL* is used throughout Ohio at universities as part of the curriculum for undergraduate horticultural courses.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

2. **Key Theme: Adding Value to New and Old Agricultural Products**

(Reference OSU Plan of Work Research Program 1B: Value Added Products)

a. **Description of Activity** - The success of Ohio's agricultural production system, as a competitor in the global economy, is largely dependent on its ability to produce and deliver low cost - high quality food and feed ingredients and food products that are needed, wanted, and can be paid for by domestic and foreign users, processors, and consumers. Identifying the potential of and opportunities for adding value to the raw products of agricultural production for both food and non-food uses will improve the economic situation for producers. One example of adding value to a standard product is the manipulation of the diet of cows to change the fatty acid composition of milk fat, especially with respect to conjugated linoleic acid which has been shown to have health benefits. A related project seeks to understand and control the chemical changes associated with warmed-over flavor of beef when cooked beef is reheated. A third project examined an extrusion method to enhance the shelf life of corn, oat and corn/oat blended flours. Finally, another research project has attempted to identify new and emerging value-added markets for grains and oilseeds.

b. **Impact** - Each of these representative projects could have major impact on sale of products. Changing the composition of milk fat to increase the quantity and type of unsaturated fatty acids could create a niche market for "healthy" milk fat. Control of the warmed-over flavor in beef and the production of corn/oat flour with longer shelf life

both could substantially increase markets for the food processing industry. Finally, economic analysis of markets is of obvious importance.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

3. **Key Theme: Innovative Farming Techniques**

(Reference OSU Plan of Work Research Program 1C: Innovative Farming Techniques)

a. **Description of Activity** - Agriculture has changed dramatically during the twentieth century. The application of research discoveries in nutrition, genetics, physiology, management, and disease and pest control of plants and animals has enabled the U.S. producer to become the most productive in the world. Development of new technologies has permitted crop and livestock producers to make steady increases in productivity. Adoption of mechanization and automation has resulted in increased unit size. Often the new technologies have permitted producers to utilize practices and procedures that previously were not feasible. For example, precision farming using a Global Positioning System (GPS) have become almost routine, necessitating the alteration of farm equipment. This has spawned a project to determine the most effective width of fi eld equipment. One research project has developed improved techniques to agitate contents of the sprayer tanks while applying pesticides, while another has examined agronomic, environmental and physiological variable affecting weed seed germination in order to develop biological and ecological methods to control weeds with reduced pesticide use. Soil compaction by equipment problems has been studied as well as the factors which influence effectiveness of no -till cultivation of corn.

b. **Impact** - Newer methods of technology such as precision farming and the development of methods which reduce the quantity of pesticides needed not only have had an impact on the economic return but also have had positive effects on the environment. The study of soil compaction has led to redesign of farming equipment.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

4. **Key Theme: Animal Production Efficiency**

(Reference OSU Plan of Work Research Program 1D: Increased Animal Production Efficiency)

a. **Description of Activity** - Animal agriculture is of major economic importance in Ohio, providing approximately 36% of all cash receipts from farming in 1997. More so than most states, animal agriculture is very balanced in Ohio with virtually all major agricultural animal species contributing to the state's economy. Major animal research

efforts are increasing the efficiency of producing animal protein, animal well-being, and product quality. Understanding the basic properties of the animal requires the application of a broad group of biochemical, molecular biological, physiological, genetic and nutritional and management techniques. Factors affecting animal product quality, disease status, and efficiency of production are genetically controlled. Physiology also impacts animal growth and reproduction. As plants and animals are modified, the factors regulating nutrient use and requirements, as well as regulat ory role of cell function, must be studied. It is becoming increasingly important for the disciplines to work collaboratively to address issues and enhance progress.

Work in improvement of animal production efficiency can be conveniently divided into four categories - management, nutrition, reproductive physiology, and genetic/molecular biology. Management projects involving beef production ranged from the study of the use for cattle grazing of highly erodible crop land removed from crop production under the Conservation Reserve Program of the USDA to the study of the advantage of early harvest of beef calves. Projects involving management issues of dairy cattle included the study of low-forage diets and new low-fiber varieties of corn for corn silage as well as systems of price risk management to level out fluctuations in income of dairy farmers. Nutrition studies, conducted with poultry, examined the efficacy of alternative feed sources such as tomato pulp and tomato pomace and with high producing swine to determine optimal amino acid and mineral needs. Studies were conducted with ruminants to examine the metabolic effects of dietary fat and of low-fiber diets.

A group of research scientists is working on issues dealing with reproductiv e physiology of ruminants, ranging from basic research of ovarian function to the development of more effective means to regulate follicular growth. Other research scientists are studying the genetic and molecular biology controlling muscle growth and cha racteristics of beef cattle, including tenderness of resultant meat.

b. **Impact** - Alternative management style and nutritional studies have increased the opportunity to profitably raise beef cattle in Southern Ohio which has been and continues to be economically depressed. Study of alternative and new varieties of plant feeds are clearly important for the economic benefit. Improving reproductive performance as well as the quality of the finished product is of obvious economic importance to the livestock industry.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

5. **Key Theme: Plant Production Efficiency**

(Reference OSU Plan of Work Research Program 1E: Increased Plan Production Efficiency)

a. **Description of Activity** - Economically the plant industry is the largest segment of agriculture in Ohio, providing approximately 64 percent of all cash farm receipts. The diversity of Ohio's plant agriculture is significant ranging from soybeans and corn to

fruits and vegetables plus other speciality crops. Ohio's plant industry face s many challenges and opportunities in the future. Concern over the environment, while always of great importance, has become a top priority as the industry moves effectively to develop new and innovative ways to protect Ohio's natural resources. Concerns regarding global warming and water quality will require plant agriculture and society to use sound science to determine the best solutions to emerging issues. Research on corn has included the search for new ways to introduce exotic germ plasm which could give a higher resistance to microbial pathogens and enhanced opportunities for marketing of value-added grains. Experiments on defoliation of high-oil corn have provided results which can be used to formulate guidelines for assessing defoliation injury to high-oil corn blends. Other research involved finding methods to conduct sweet corn seed tests and the use of molecular biology to facilitate breeding and development of new varieties of tomatoes that combine enhanced disease resistance with improved n utritional characteristics.

b. **Impact** - The large and varied plant research program has given Ohio farmers a large number of varieties of various plants to make them more competitive but obviously such research must continue to respond to ever-changing conditions and markets.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

6. **Key Theme: Animal Health**

(Reference OSU Plan of Work Research Program 1F: Enhancement of Animal Health)

a. **Description of Activity** - Animal health issues are of major concern to the food animal industries because approximately 10 percent of the animals raised are lost to mortality. Losses due to morbidity and decreases in production efficiency are substantially greater. Some of the major infectious disease problems have been brought under control. Nonetheless, a variety of economically significant diseases continue t o plague the food animal industries. Combinations of mild pathogens that could cause significant health problems are common. In addition, new disease entities continue to emerge and diseases that were controlled reemerge. Our research continues to focus on respiratory and enteric diseases which are the major ones affecting the different species of food producing animals. One area that has had major emphasis and promises to have major impact is that of detection of infectious organisms using tools from m olecular biology. Diagnostic testing of infectious bursal disease virus used reverse transcriptase and polymerase chain reaction (PCR). PCR was also used to study viruses that causes gastroenteritis and respiratory diseases in swine.

b. **Impact** - Use of molecular biology techniques, not only provide a means of definitive diagnosis, but also provide a basis for developing new methods of control. For example, these studies have led to the development of a new method for production of

vaccines for rotoviruses responsible for much of the gastroenteritis in young animals and children.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

7. **Key Theme: Plant Health**

(Reference OSU Plan of Work Research Program 1G: Enhancement of Plant Health)

a. **Description of Activity** - Plant diseases and insect pests represent a significant threat to the economic stability of the nation's agricultural industry and to the quality of life of the citizenry. On a global scale, plant diseases and insect pests are a significant threat to human and animal life because of a number of factors including malnutrition, famine and microbial toxins. In Ohio, diseases and pests account yearly for significant losses in agricultural production and the value of landscape plants. Although some diseases and pests are well controlled, others are not and new diseases and pests emerge often. Changes in agricultural practices also have an important effect on the economic significance of certain plant diseases and pests. Methods used to control diseases and pests affect the costs of production and sometimes impact the environment. Plant disease and insect pest research in Ohio is focused in several primary areas: 1) Molecular biology of host-parasite interactions; 2) Biology and management of soil-borne plant pathogens; 3) Biotechnology-based pathogen detection and diagnostics; 4) Maize virology; 5) Epidemiology; 6) Biology, ecology, and behavior of insects, mites, and other invertebrate plant pests; 7) Physiological, biochemical, and molecular basis for insect-pest/ host-plant interactions; and 8) Biologically and ecologically based control strategies for pest species. Research, in any one of these areas can involve fungi, bacteria, viruses, phytoplasmas or nematodes that infect field, fruit, vegetable, ornamental, landscape or turf crops. Most notable examples are the use of biotechnology to study viruses and bacteria infecting corn and fungal infection of strawberries. Other studies examined systemic resistance to bacterial infectio nusing rhizosphere microorganisms. Methods for sequential sampling of strawberry plants were also developed.

b. **Impact** - Greater understanding of the biology of viruses, bacteria and fungus at the molecular level has provided an opportunity to develop more effective methods of control. The investigation of methods of bio-control and more systematic detection methods has resulted in reduced application of chemicals to control pests, which is not only economically advantageous to the producer but is beneficial to the environment.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

8. **Key Theme: Agricultural Competitiveness**

(Reference OSU Plan of Work Research Program 1H: Economic Competitiveness)

a. **Description of Activity** - United States agriculture has a productive land base, innovative producers, and variable but generally favorable growing conditions. The application of research output, from production to processing and marketing, has resulted in an agricultural system in the United States that is competitive in world markets. With growing affluence in the U.S. and around the world, there will be increased competition for land, water, and other resources. Increased affluence will also lead to wider demand for high quality protein diets. This will require programs that focus on multiple production systems varying in size and complexity. Production systems in other regions of the world will also attempt to supply international markets. Competitiveness is influenced by regulations, trade barriers, local, regional, or national policies, and international agreements. United States agriculture must continue to adopt new technologies, explore new structures, and respond to policy changes if it is to remain competitive internationally. One notable example is research on the changing patterns of food consumption in the United States as well as other developed countries based upon health or perceived health benefits. The increasing production of crops which have been altered by biotechnology has also been examined with respect to competitiveness in global markets.

b. **Impact** - It has become clear that changing patterns of food consumption must be considered with respect to agricultural policies. It is c lear that biotechnology and will continue to have effects on marketing which must be addressed by policy strategies.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

9. **Key Theme: Ornamental/Green Industry**

(Reference OSU Plan of Work Research Program 5C: Green Industry)

a. **Description of Activity** - The green industry is the fastest growing segment of Ohio's agriculture economy and is projected to rank fourth behind only soybeans, corn, and poultry in farm cash receipts within the next few years. Bedding plants and trees play a vital role in enhan cing the quality of life through our beautiful landscaping and conservation efforts to improve the environment. The turf -grass industry continues this interaction of environmental and quality of life enhancement as it constantly improves and develops heal thier lawns, golf courses, and other sport fields. The well-manicured lawn is a source of pride whether in the rural setting or the confines of the urban surroundings. The green industry is a common bond for the rural/urban interface. A number of projects have been conducted relevant to the green industry, ranging from the use of molecular biology to find restriction, amplification, fragment polymorphic markers of ryegrass for out-crossing to the use of composted yard waste and sewage sludge as

top-dressing fertilizer for turf-grass. Other projects include determining the most efficient timing of pre-emergence herbicides relative to irrigation/rain and identifying plants that can easily adapt to urban environments.

b. **Impact** - The type of research represented here has had a clear impact on the turf-grass and bedding plants and tree industry in Ohio.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

Goal 2. A Safe and Secure Food and Fiber System

Executive Summary

Food safety is an issue of growing national and international concern. Some of the most critical issues are chemical and antimicrobial residues, physical hazards in foods, and microorganisms pathogenic to humans. The development of new strains of organisms, as well as the potential spread of old and new ones, requires the utmost care and vigilance because of worldwide food and animal feed distribution. This has implications to youth programs that are teaching the next generation of the livestock industry to be better prepared to participate in safe food production in the future.

Fortunately, along with the increased threat of food-borne pathogens, there have been improved methods of detection, based upon biotechnology. Further, newer methods of food pasteurization are being developed. These include high-voltage, pulsed electric field and high-pressure mechanisms, which have minimal adverse effects on nutrients.
At the same time that food safety is an issue, there is an increased demand by consumers for foods of greater convenience. Consumers' lifestyles, hence their eating habits, are constantly changing. These changes bring about increased demand for high quality, value added, and convenient foods. This requires that production of food ingredients, which are as nutritious as non-processed counterparts and are not subject to contamination with harmful microorganisms during production and shipment.

Although research that leads to a safer food supply is actively in place, scientists acknowledge that the safest foods are still a hazard if mishandled during food preparation just before consumption either in a food establishment or at home. Consumer and food worker behavior is an important issue to address to complete the assurance of the safe food cycle. Education efforts, either in higher education or through outreach, have focused on this critical need so that the "human factor" can be reduced or eliminated as a cause of food-borne illness.

Successful Programs and Benefits

Highly successful programs this year include:

1. Research into new methods to pasteurize or otherwise reduce the pathogen load on foods; results are new funding streams (USDA, Section 406) and peer-reviewed publications.

Wittum, Thomas. Antimicrobial Drug Use and the Development of Resistant Enteric Bacteria in Dairy Cattle. USDA, National Integrated Research and Extension Grants, Section 406.

Zhang, Qijing. Factors Affecting the Emergence of Quinolone - Resistant Campylobacter in Poultry. USDA, National Integrated Research and Extension Grants, Section 406.

2. Research to identify and validate consumer behavior priorities to serve as a research-base for higher education and outreach programs; results are new funding streams (USDA, NRI and FSQ Initiative) and peer-reviewed publications.

Medeiros LC, Hillers VN, Kendall PA. Program Indicators and a Web-based Reporting System for the FSQ Initiative. USDA, Food Safety and Quality Initiative

Medeiros LC, Hillers VN, Kendall PA. "Development and Validation of Instruments to Evaluate Food Safety Education. USDA, NRI.

Additional information on this program is summarized under the Key Themes section.

3. Education or outreach in food safety training to higher education, food establishment managers and entry-level food workers. The results are a more highly-trained work force demonstrated by greater knowledge.

-- Sixty-five students in HNFM 450 Kitchen Layout, Design and Sanitation course in the Department of Human Nutrition and Food Management completed the ServSafe course. Of these students, all but two received certification after passing the national certification examination.

-- Thirteen agents were trained in ServSafe, a curriculum for food establishment managers, and 4 country-level programs were held between October and December of the reporting year. All agents qualified as instructors (scored 90 or above) in the curriculum through the National Restaurant Association Educational Foundation. Twenty-two county-level participants attended and successfully completed the national certification examination, passing with scores of 84 or above. Occupations of the participants included a staff member at a nursing home, restaurant owners, and a chef-in-training.

-- Thirteen program assistants were trained in Pathways to Food Safety, a curriculum for entry-level food handlers and 142 individuals from county-level programs were trained from October to December of the reporting year. Each participant in this food safety program was referred to Ohio State University Extension from some type of job training program for welfare-to-work individuals. At least 23 participants gained employment as a result of attending this program.

4. Outreach to individuals and families who are considered to have limited resources for daily living; results are low-income individuals demonstrated improved practice in safe food handling.

In the past reporting year, over 24,000 individuals participated in outreach educational programs sponsored by two Ohio State University Extension programs - EFNEP and FNP. Food safety competencies are taught in both program curriculums. The following are impacts documented by the programs:

EFNEP

-- 52 percent (1,237 participants) of homemakers showed improvement in one or more of the food safety practices (i.e. thawing and storing foods properly).
-- 16 percent (389 participants) of homemakers showed improvement in both of the food safety practices (i.e. thawing and storing foods properly).

FNP

--	Number of fact sheets distributed	74,328
--	Number of educational sessions held with two or more participants	929
--	Number of participants attending presentations and/or demonstrations	16,497
--	Number of participants who learned new information	10,068 (61%)
--	Number of participants who plan to make recommended changes	7,546 (46%)
--	Number of participants who are now using recommended practices	5,900 (36%)

5. Outreach to youth through the 4-H quality assurance programs resulted in greater awareness and knowledge of the participants. The Ohio 4-H program promotes food safety through quality assurance programs that teach youth the importance of animal health to the maintenance of a safe food supply. This reporting year, 11,105 youth participated in programs. Of these, 8 percent were designated as representatives of under-served groups and 18 percent of under-represented groups in extension outreach education. Knowledge gained was documented for 56 percent of all participants.

This last year of research, education and extension/outreach has been marked with many accomplishments that represent progress from the baseline. While not all goals in the Plan of Work have been accomplished, the securing of new funding and the establish ment of new educational and outreach programs to transfer research-based information to those who can best apply the information represents firm progress those accomplishing those goals in the strategic plan for goal 2.

Goal 2 Key Themes

1. Key Theme: Food Safety

(Reference OSU Plan of Work Extension Program 2Ae: Pre-Harvest Food Safety)

a. **Description of Activity** - Key livestock/dairy/poultry teams, State/Federal agencies, and Ohio Livestock Coalition, and commodity groups have developed contemporary

publications and presented key presentations to both adult and youth audiences, focused on "commodity" specific food safety programs. Currently, high profile programs include pork, beef and egg quality assurance programs that have been presented in conjunction with respective statewide commodity organizations at all 2000 annual commodity - focused symposiums and conferences.

b. **Impact** - More than 7,500 adult and youth food animal producers received commodity - focused quality assurance training to assist them in meeting compliance standards being implemented by respective processing industries. OSU Extension's commodity teams continued to build strategic partnerships with appropriate regulatory agencies to assure that Ohio's $9 billion food animal industry provides Ohio and the nation with safe, wholesome products.

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

d. **Scope of Impact** – State Specific

2. Key Theme: Food Safety

(Reference OSU Plan of Work Research Program 2Ar: Pre-Harvest Food Safety)

a. **Description of Activity** - Food safety is an issue of national and international concern. Food-borne illness caused by microbial contamination can be especially dangerous to vulnerable populations. Even though food-borne illness can arise from a multitude of causes, as few as seven types of bacteria were identified as the cause of one quarter of the food-borne illness outbreaks reported. *Salmonella enteritidis*, *Escherichia coli* 0157:H7, and *Listeria monocytogenes* have now emerged as leading causes of food-borne illness. It has been estimated that only a small portion of actual, food poisoning cases are reported. Whether reported or unreported, food-borne illness is costly to the economy. In most instances, food produced and processed under hygienic conditions is relatively free of risk. However, constant vigilance from production to consumption is important in maintaining a safe food supply. New methods for control of bacteria that are being developed are high voltage, pulsed electric field and high pressure. High pressure treatment has been used to study stress tolerance of bacteria.

b. **Impact** - The primary method for non-thermal food pasteurization available to industry at present is irradiation but this technology elicits fear in some consumers. Alternatives to this technology being developed are high voltage and high pressure techniques which do not have the negative connotations with the public.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

3. Key Theme: Other - Functionality of Food

(Reference OSU Plan of Work Research Program 2C: Functionality of Foods)

a. **Description of Activity** - Consumers' lifestyles, including their eating habits, are constantly changing. These changes bring about increased demand for high quality, value added, convenient foods. New frozen and convenience products must be developed to meet these demands. One of the most rapidly growing trends in the convenience food market is fresh, fully prepared items for take home consumption. Consumer desires for unprocessed and minimally processed foods require that the traditional thermal methods used to inactivate enzymes be replaced with alternatives which may have less impact on flavor and texture. A need exists to investigate procedures and methods to enhance the flavor, functionality, product quality, and consumer-acceptance of processed foods. These procedures will also increase the value of the products and increase food safety. One example of this type of research is focused on the use of milk whey protein for production of adult nutritional products. Another is the use of electrostatic technology to add coatings to food such as salt to potato chips.

b. **Impact** - Food processing is a major part of the agricultural industry in Ohio and that industry relies heavily on the information developed by food scientists at The Ohio State University. This partnership is reflected by industry support of research and direct interaction of food scientists with industry problems.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

Goal 3. A Healthy, Well-nourished Population

Executive Summary

Food provides, both, pleasure and the chemicals necessary for our health and survival. A well-nourished population is one which has met nutrient and non-nutrient needs from food without consuming calories in excess of those expended. It is important to recognize that nutrient needs vary over the life cycle and research must be conducted to determine how age and gender influence nutrient needs. It is also important to note that food contains physiologically important chemicals that are not nutrients. These physiologically active chemicals are now called "nutraceuticals" to denote that they can act pharmaceutically, and, just like any other drug, they can have unwanted side effects. That is why it is so important that foods suspected of having beneficial properties be studied in great detail which requires a team approach. The Ohio State University is one of the few institutions in the world which has both a highly productive agricultural faculty as well as world-class medical facilities dealing with chronic diseases including heart disease and cancer. From these diverse groups, a team has been constructed which includes plant biologists, food scientists, biochemists, and physicians. This team is studying such agricultural products as tomatoes and raspberries for their content of chemicals that are effective as antioxidants and as anti-carcinogens.

A healthy, well-nourished population is dependent on the ability of people to obtain foods that will improve the over-all quality of their diets, and the quality of the food they eat. A healthy population also engages in other positive health practices, including physical activity, individual health monitoring, and safety practices

that will reduce the risk of accidents and disease. Extension personnel of the Ohio State University have been very active at educating the people of Ohio regarding the importanc e of good health and nutrition practices as they have met with individuals and groups, in formal and informal teaching sessions, in workshops, committee meetings, health fairs, and walk-by exhibits. The result has been a change in 1) the way some individuals purchase, prepare and store food; 2) the level of interest in monitoring and improving health through screenings and exams; and 3) the ability of individuals to improve their personal practices to decrease health risk.

Stakeholder input through the Foo d and Nutrition Extension Advisory Committee indicates a desire of specific population groups to acquire the information and knowledge necessary to improve nutritional health. Teens want the latest way to make food and its components their edge in sports competition. Teachers want resources to help them teach the in-school pregnant teen about the importance of good eating for themselves and later for their baby and toddler. School food service personnel need to know how to incorporate the Dietary Guidelines recommendations into school meals. The elderly want ways to keep their blood pressure under control and their blood cholesterol levels manageable. They are split between those elderly who are so busy that they have no time to cook, and need to learn the tricks of eating out healthfully, and those who have no desire to prepare food because of declining health. A study of changes made by EFNEP clientele in Virginia suggests that by delaying, shortening or eliminating specific risk factors for disease through diet and health changes clientele and/or taxpayers can realize a $2 to $17 savings in health costs for each dollar spent teaching them..

Ohio's low income population wants ways to make their food money go further, whether it is healthful or not, and the professionals and para-professionals servicing this population want to give money stretching ideas that are nutritious. The Food and Nutrition Advisory committee has also requested more help in advising target audiences about dietary supplements, change d recommended dietary allowances of specific nutrients (folate, calcium, etc) and how to incorporate them into a healthy diet, and the role of non-nutrients (fiber, antioxidants in food).

Goal 3 Key Themes

1. Key Theme: Human Nutrition

(Reference OSU Plan of Work Extension Program 3Ae: Human Nutrition/Health)

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

1. **Key Theme: Human Nutrition**

(Reference OSU Plan of Work Research Program 3Ae: Human Nutrition/Health)

a. **Description of Activity**: There are a variety of nutrition education interventions available to educate older adults as well as encourage them to make positive dietary and lifestyle changes. Since 1996, one State Nutrition Specialist has collaborated with S pecialists in two other states, an individual at a non-land-grant university, and private industry to develop and test the effectiveness of nutrition and health education materials (titled Staying Well) specifically geared to senior citizens. The Stages of Change evaluation model was used. Older adults are the fastest growing segment of the population in the US. It is critical to encourage nutrition education as well as health promotion in order to help them reach and maintain optimal health status.

b. **Impact** - Stage of change for fruit, vegetable, and dairy food intake of the entire group was in the higher stage of Maintenance. Being male or female was not a predictor of an individual's stage of change. Nor did educational background have an influence. Marital status may affect the level of readiness to change behavior, with those who are widowed tending to be already practicing the desired behavior. In general, older adults tended to score into the higher stages of change and showed a greater interest in changing health behavior than those who were younger in age.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

3. **Key Theme: Human Nutrition**

(Reference OSU Plan of Work Research Program 3Ae: Human Nutrition/Health)

a. **Description of Activity** - *NEON* (*Nutrition Education ONline*) is a web-based nutrition education program for pregnant and parenting teens. It is implemented through Ohio secondary schools and may be facilitated by EFNEP educators who work locally with the GRADS (Graduation Reality and Dual role Skills - a program conducted by the state department of education to keep pregnant and parenting teens in school until they graduate) program to teach nutrition. This curriculum is designed to enhance learning and t o be available to access both in and outside of the classroom

b. **Impact** - Pregnant or parenting teens (n=105) using *NEON* curriculum significantly improved daily consumption of fruits and vegetables by about 0.7 - 0.8 servings after exposure to the curriculum; whereas a comparison group of similar teens (n=112) consumed the same number of servings of fruits and vegetables daily over the same time period but without exposure to *NEON* (improvement only 0.1 servings daily for both fruits and vegetables).

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

4. **Key Theme: Human Health**

(Reference OSU Plan of Work Research Program 3Ae: Human Nutrition/Health)

a. **Description of Activity** - More than one million people will be diagnosed with skin cancer each year and 8,500 people will die each year from skin cancer. Most of these skin cancers are treatable if diagnosed early. Developing safe sun practices early in life and, especially among high-risk populations, can reduce the incidence of skin cancer. Adhering to better dietary practices, following risk reduction guidelines for other cancers, osteoporosis, heart disease, etc also can reduce other diseases. State Specialists developed lessons and handouts for positive health promotion programs, or helped the local extension agent plan and implement these programs and activities.

b. **Impact** - In one county, 175 people attending the Women's Health Forum heard six quality presentations on Bone Density and Osteoporosis, heart Disease in Women, Skin Cancer, Diabetes Care, Estrogen Replacement Therapy and Menopause and Arthritis Prevention and Care. When asked how they plan to use the information, responses included, "I intend to continue my hormones, get a bone density test, have my moles checked and increase my exercise and lose more weight". "I plan to have a complete medical checkup to prevent any complications that may occur in later years". On a five point scale (5 high), the average response was (4.3) for knowledge gained and usefulness of information.

Sun Safety:

-- Over 50 counties have offered sun safety and skin cancer programming in Ohio.
-- At least 4 counties have purchased their own Dermascan equipment (an instrument that helps an individual assess the amount of skin damage) to extend programming potential.
-- Most counties have offered educational events that have reached across program area lines and have also involved collaboration with other health related or work related entities, i.e. health departments, hospitals, farm groups, public schools.
-- Mail follow up surveys show that 50 percent of respondents report behavior changes including wearing a sun safe hat, wearing sun glasses, using sunscreen, awareness of time working in sun, and protective clothing worn while in sun.
-- Inquiries from a major international airport, an international horticultural grower and exporter, and a large business in Ohio have come in with requests for recommendations on hats to purchase for outdoor workers of these organizations.
-- A national manufacturer of hat linings contacted the Ohio Extension Specialist for information and assistance on developing prototype sun safe hats to show to hat manufacturers.
-- Three popular publications, two state and one national, contacted Ohio Extension for stories on Operation Hatcheck. Stories were printed. One catalog company features a reference to OSU Extension on sun safe hat information.

a. **Source of Federal Funds** - Smith-Lever 3b&c

a. **Scope of impact** - State Specific

1. **Key Theme: Human Health**

(Reference OSU Plan of Work Research Program 3Ar: Human Nutrition/Health)

a. **Description of Activity** - A healthy, well-nourished population starts with having food available in adequate amounts. People then need to know what and how much to eat to produce maximum health benefits. While considerable information exists on the nutritional needs of healthy, young adults, far less comprehensive information is available on the nutritional needs of children and youth, the elderly, and those with reduced resistance to infection. Many chronic diseases affecting people have a nutrition component, so that research into the effects of nutrients and food components on body metabolism is one of the first steps needed in determining what foods are necessary for optimal health. A healthier population is more than nutrition. It is also achieved by improving safety in the home and workplace and by creating health services in areas lacking them, improving those that exist, and matching individuals and groups with health services that already exist. Studies have focused on human nutrition, including nutrient needs (e.g., selenium) during the life cycle and the intake and physiological consequences of trans-fatty acids.

b. **Impact** - In recent years, it has been increasingly recognized that nutrient needs vary over the life-cycle and therefore it is necessary to carefully investigate the effect of gender and age on nutrient requirements for health optimization. Changes have occurred in food

processing, such as the production of trans-fatty acids during hydrogenation of unsaturated fatty acids to produce "hardened" margarine. This has given rise to the question of the effect of these modified fatty acids on heart disease risk which is related to the consumption of butter and plant (soybean and corn) oils, both of which are of economic importance to Ohio.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

6. **Key Theme: Nutraceuticals**

(Reference OSU Plan of Work Program 3B: Nutraceuticals)

a. **Description of Activity** - Brief description of the activity: Over five billion dollars was spent on herbal supplements in 1997. By the year 2010 the expense of herbal supplements has been estimated to reach 25 billion dollars. Many people are not very knowledgeable about their effectiveness or the regulations that cover them. A team of Ohio Extension Agents and State Specialists wrote a series of fact sheets to help the public understand the risks and benefits of taking a variety of herbal supplements. They have been distributed at professional meetings nationally, and are available on the Internet for the public to access. An individual from the OSU College of Pharmacy helped in the preparation of the fact sheets.

b. **Impact** - Since publishing the fact sheets (08/00), over 1,000 have been distributed through county Extension Agents and 300 have been downloaded off the Internet site. By distributing factual information and pointing people to additional credible sources of information, the authors hope to reduce the incidence of negative side effects of risky herbal supplements.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

7. **Key Theme: Nutraceuticals**

(Reference OSU Plan of Work Research Program 3B: Nutraceuticals)

a. **Description of Activity** - Foods have become substantially more important than carriers of nutritional material. Naturally occurring components of foods may pose toxicological concern, but new research may reveal information that they also contain compounds which have beneficial effects on animal and human health. For example the presence of lycopene isomers in biological samples and oxidized lycopene solutions suggest a possible link between its oxidation and isomerization mechanisms. A clearer understanding of these mechanisms will provide key insights into the relationship between lycopene in the diet, absorption into the bloodstream, deposition in tissues, and the corresponding reduced risk of certain cancer types. Epidemiological evidence from other studies indicates a high intake

of fruits and vegetables decreases the risk of cancer in humans. Although interrelated with value-added products and food safety, the search for and enhance of naturally occurring compounds in agricultural products that have beneficial effects on human health is a research interest of Ohio researchers. Projects have examined the biochemistry of lycopenes from tomatoes and berry extracts, including ellagic acid, to determine their effectiveness in the prevention of cancer.

b. **Impact** - Nutraceuticals have been investigated by medical researchers for the past several years to determine their effectiveness against chronic diseases such as cancer. In the projects described here, food and plant scientists have joined with biochemists and physicians to form a team to study the effects of these plant chemicals as well as cultivation/biotechnology methods to alter the content of specific chemical components.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

Goal 4. Greater Harmony Between Agriculture and the Environment

Executive Summary

Ohio has tremendous advantage in agricultural production and food processing because it is close to population centers for marketing. While this geographical advantage ha s made agriculture the number one industry in the State, it has provided a tremendous challenge to conduct farm operations in the midst of a high population density. Because of this, the agricultural community has been very cognizant of the need to take care of the environment. Work has progressed on methods to dispose of animal wastes by composting and judicial distribution on farm land. Precision farming has been used to minimize fertilizer and pesticide application for economical as well as environment al reasons. Scientists are finding more effective ways for pest control through by developing newer integrated pest management systems. All of these methods help to ensure high water quality.

In addition to the usual methodology to minimize environmenta l damage, scientists at The Ohio State University have created a team, called ecosystems management, which seeks to use ecologically sound principles to not only increase profitability but also be environmental friendly. This systems management approach has been extended to the classroom in the education of undergraduate students as well as graduate students.

As livestock production continues to expand in Ohio and with the odors, dust, insect pests, and water pollution associated with the increased number s, there is a need to provide educational programs to producers on composting livestock mortality and composting animal waste. Due to the diverse distribution of the state's population, livestock producers, commodity groups and OSU Extension are taking a proactive approach to improve neighbor relations by providing programs that ameliorate issues associated with agricultural waste.

Ohio contains nearly 7.9 million acres of forests and woodlands. OSU Extension district specialists, county agents and Soil and Water Conservation District personnel provide newsletters and best management practice workshops across the State, addressing a wide variety of topics, including but not limited to House Bill 88 - Agriculture Pollution Abatement Law and issues related to silvicultural non-point source pollution.

OSU Extension, working in partnership with the Ohio Livestock Coalition and key state and federal agencies, has developed and implemented the Ohio Livestock Environmental Assurance Program (LEAP). LEAP helps livestock producers to profitably manage environmental challenges that are critically important to the success of their business.

Goal 4 Key Themes

1. Key Theme: Agricultural Waste Management

(Reference OSU Plan of Work Extension Program 4Ae: Agricultural Wastes And By-Products)

g. **Description of Activity** - Livestock production continues to expand in Ohio. But due to the distribution of the state's population throughout Ohio and the extensive network of streams and rivers, the potential for environmental and rural-urban conflicts is significant. Odors, dust, insect pests, and water pollution are all potential environmental impacts from livestock production operations. Livestock producers and their commodity groups are deeply interested in developing and implementing practices on a voluntary, farm-by-farm basis in order to be good neighbors and to attempt to head off more regulations.

h. **Impact** - Over 3,200 individuals participated in educational programs on composting livestock mortality and composting animal waste.

i. **Source of Federal Funds** - Smith-Lever 3b&c

j. **Scope of Impact** - State Specific

2. **Key Theme: Agricultural Waste Management**

(Reference OSU Plan of Work Research Program 4Ar: Agricultural Wastes And By-Products)

a. **Description of Activity** - The strategic location of Ohio agriculture to the large Eastern US consumer market has resulted in significant growth of all sizes of new farm animal facilities. Some of these animal facility owners and operators are finding them selves in neighborhood conflicts over environmental quality and social acceptability. While Ohio has every reason

to support economic growth in the agricultural sector, the citizenry must be sure that the quality of life is maintained or improved and that there is no long-term degradation of the environment. Odors and dust from manure can create annoyances near the production and manure storage facilities and near fields where surface spreading is done. Added to the odor annoyances have been cases of neighborhood insect problems and overloading of soils with nutrients such as nitrates and phosphates. The nutrient overloading concern carries well beyond the production facilities and land application sights to water supplies, streams, and lakes.

The OSU Ohio Agricultural Research Development Center (OARDC) food animal production research facilities are equally vulnerable to creating environmental problems while potentially being exemplary models of appropriate technology and environmental stewardship. An OSU team of faculty and staff have since organized the Ohio Composting and Manure Management Program (OCAMM) with approximately 30 Ohio livestock producers, livestock facility designers and consultants, compost manufacturers, manure and compost users, equipment manufacturers and public agency technologists. The overall goal of OCAMM is to identify issues and technologies leading to safe, economic utilization of livestock manure with minimum odors and nutrient losses to water supplies.

b. **Impact** - Work of OCAMM is establishing the OARDC facilities as exemplary environmental stewards with respect to composting and manure management. Through seminars, tours, field days and support of research, it has disseminated information to stakeholders to help them solve composting and manure management problems.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

3. **Key Theme: Integrated Pest Management**

(Reference OSU Plan of Work Extension Program 4B: Integrated Pest Management)

a. **Description of Activity** - The goals of Integrated Pest Management (IPM) are to promote minimized pesticide use, enhanced environmental stewardship, and sustainable systems. These goals are achieved by protection of commodities, homes, and communities with environmentally and economically sound practices that result in abundant, high quality supplies of food, fiber and ornamental products and improved quality of life. Several forces in the United States today are intensifying the need for increasing the practice of IPM. The Food Quality Protection Act (FQPA) passed by Congress in 1996 may result in the removal of many traditional conventional pesticides from the marketplace. Ohio has a strong agricultural base but it is a highly urban and suburban state that is undergoing strong growth in the urban pest control industry, with increasing interest in environmentally sound pest management. Increasing public concern with rural-urban interface issues involving agricultural practices, and intolerance toward toxic pesticides in food and in the environment, mean that alternative methods of pest control will need to be developed. To this end, a number of projects related to IPM has been initiated, ranging from a search for

varieties of soybean resistant to soybean cyst nematode to the use of predatory spider mites, along with minimal application of an insecticide, to control spider mites damaging to pumpkins.

b. **Impact** - Development of IPM has resulted in the use of less pesticides and more economical means of crop production.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

4. Key Theme: Water Quality

(Reference OSU Plan of Work Extension Program 4De: Water Quality)

a. **Description of Activity** - Public officials in urban and suburban areas are faced with increasing regulations related to improving their water resources and a variety of land use decisions each day that can have dramatic cumulative impacts on water resources in their communities. The Non-point Education for Municipal Officials Program (NEMO) is designed to give them the information they need to protect their local water resources by examining a variety of land uses and their impacts. Best management practices are also important for agricultural producers to incorporate into their farming operations.

b. **Impact** - Twenty-nine public officials from Mercer and Montgomery Counties in Ohio participated in two NEMO programs. Thirteen of these participants indicated they would apply the information presented in their work. Five watershed groups exist within the counties, and one funding proposal was submitted with Extension involvement.

-- Twenty participants in Champaign County, Ohio gained more information about the monetary values of best management practices (BMPs).

--In Ohio's Grand Lake St. Mary's watershed, 80 participants learned about best management practices; 25 of them planned to adopt one or more BMPs; 15 worked with natural resource professionals in planning BMPs; and 3 actually installed BMPs.

-- Three Amish communities in Ohio comprised of 1,750 program participants have been involved in programs to prevent over-application of nutrients to grain fields. Of this total 1,500 are defined as both under-served and under-represented audiences; 250 are now working to install BMPs, encompassing 5,000 acres.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

5. **Key Theme: Water Quality**

(Reference OSU Plan of Work Research Program 4Dr: Water Quality)

a. **Description of Activity** - Agriculture represents the largest industry in Ohio. The production of food and fiber occurs throughout the state on farms and forests that are highly diverse in terms of size, crops, and production philosophies. At the same time, Ohio is a rapidly suburbanizing state. The rural non-farm population continues to increase and those residents expect to enjoy the quality of life benefits of "living in the country" and, at the same time, are demanding that agricultural producers be more environmentally friendly in their livestock, crop, and fiber production practices. The production of food and fiber often requires complex strategies that must be balance profitable and efficient farming with water quality and quantity concerns. In Ohio, surface water resources supply the public and rural water needs of about 55 percent of the state's population. Ground water resources supply these needs for the remaining 45 percent. However, in rural areas of Ohio, ground water resources supply approximately 98 percent of the rural domestic water use. Therefore, agricultural production systems that consider water quality are imperative in Ohio. One of the most common water quality issues is nitrate content. One study has focused on water table management to induce bacterial removal of nitrate as nitrous oxide.

b. **Impact** - Maintaining a high water table for a prolonged period in the most biologically active portion of the soil was found to maintain high nitrate removal rates.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

6. **Key Theme: Water Quality**

(Reference OSU Plan of Work Extension Program 4E: Watershed Management)

a. **Description of Activity** - OSU Extension educators have created the Ohio Watershed Network, an electronic network used to connect local watershed coordinators with each other in a manner that enables them to help each other and creates co-learning arrangements. The centerpiece for the network is a Web site, *Ohio Watersheds Online*. The site contains: 1) contact information for Extension educators with a broad range of watershed management expertise; 2) current events in the public media regarding watershed and water resource issues; 3) a calendar of upcoming educational programs and events; and 4) a list serve called Ohio Watersheds. Numerous OSU Extension initiatives are also underway in individual watersheds across the state and are lead by local county Extension Agents.

b. **Impact** - Over 300 watershed group leaders are participating in the Ohio Watershed Network. Through the network, they receive information about how to activate community members and develop watershed action plans. A needs assessment was completed to determine program priorities. Nearly half of this group represents under-represented individuals.

-- Thirty watershed coordinators participated in the "Connecting Ohio Watersheds Conference" where they gained new knowledge and skills through hands-on workshops.

-- 560 school-age children participated in a hands-on educational program, Critters from Below, on biological water quality indicators, including macro-invertebrates and fishes. Ten of the participants were identified as under-served individuals.
-- Sixteen individual Indian Lake Science Cruises were conducted in Ohio to increase the awareness of water quality and watershed management issues in the Indian Lake watershed. Four school districts participated and involved 174 third and fourth grade students, 32 teachers, and 6 volunteers (volunteers donated 48 hours of time).
-- In the Honey Creek watershed, Ohio Extension programs have increased the awareness of the general public concerning the need for clean water and the management of the watershed to provide it. Forty-eight individuals participated in the Honey Creek Watershed Project to create this awareness on the part of the public.
-- The North Fork of the Sugar Creek is the most polluted stream in Ohio. Extension programs involving 100 participants are working to improve the stream and have participated in programs on water quality and water quantity. Twenty individuals worked with natural resource professionals to implement BMPs on 200 acres. OSU Extension has been involved in grants totaling $250,000. Fifty of the participants are from under-served audiences; 40 volunteers have been involved.
-- In Mercer County, which is part of the Miami and Wabash River watersheds in Ohio, 165 individuals have been involved in Extension programs to improve water resources. Of that total, 60 are agricultural producers. Forty of them worked with natural resource professionals to install BMPs on 3,500 acres. OSU Extension has been involved in developing four grant proposals for a total of $337,000.
-- One hundred Ohio agricultural producers in the Upper Great Miami and Loramie Valley watersheds have participated in watershed educational programs. Thirty volunteers have helped to plan the programs; 60 producers are now working with natural resource professionals to install BMPs.

c. **Source of Federal Funds** - USDA Competitive Grants

d. **Scope of Impact** - State Specific

7. **Key Theme: Other - Ecosystem Based Management**

(Reference OSU Plan of Work Research Program 4F: Ecosystem-Based Management)

a. **Description of Activity** - Agriculture is the most extensive user of land in Ohio. Advances in technology, coupled with policies favoring large-scale crop monoculture and farm consolidation, have resulted in a highly productive agricultural industry. Within the same time frame, we have seen the development of environmental awareness within our society and the stewardship of our agricultural lands has come under scrutiny. The result is a situation that is often interpreted as diametrically opposed goals - maintaining productivity and profitability or protecting our environment. In response, we are developing a process for

ensuring that agricultural production, environmental and social goals are congruent. The ecosystem concept, with its focus on whole systems, provides an appropriate paradigm and practical foundation for developing a system of mana gement that can be environmentally sound, productive and profitable; thus, fulfilling societal demands. To this end, we have established an agroecosystems management program which includes participation by stakeholders, development of undergraduate courses and the establishment of an endowed professorship in Ecological Management. After an exhaustive international search, a highly qualified person was appointed to the position to give leadership to the program.

b. **Impact** - The agroecosystems management program has supported the development of interdisciplinary capacity for addressing the complexity of agroecosystems research, education and outreach by providing opportunities for interaction of stakeholders, students, staff and faculty to develop systems approaches to meeting the challenges facing today's food system.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

8. **Key Theme: Forest Resource Management**

(Reference OSU Plan of Work Extension Program 4G: Forest Resource Management)

a. **Description of Activity** - Extension and district specialists and county agents taught forest resource management to private woodland owners through a number of delivery methods.

b. **Impact** - Over 9,000 woodland owners received the quarterly newsletter, Woodlands and Watersheds, which provided them with information about forest management options, timber harvesting and how to protect water resources, and best management practices.

-- Twenty literature racks were placed in retail home improvement stores wh ere woodland owners would be exposed to various brochures designed to increase their awareness of management options for their woodland.

-- One hundred and eighty-eight woodland owners participated in the Ohio Woodland Steward Program and other forest resource management programs.

-- Two Timber Marketing programs, involving 110 participants, were held in Belmont County, Ohio, the location of recent and serious water quality complaints resulting from silviculture practices. The program evaluation indicated that nearly all expressed a change in knowledge, skills, or abilities. Twenty of the participants received one-on-one assistance. A total of 3,000 acres of forest land was impacted as a result of this program.

-- Two, two-day training sessions were conducted with Soil and Water Conservation District technicians, service foresters, and consulting foresters to teach them the process and procedures related to House Bill 88 - Agriculture Pollution Abatement Law, which includes silvicultural non-point source pollution. In total, the workshops were attended by 137 individuals. One outcome of the workshop was the

development of a new House Bill 88 Investigation Form which provides a complete and systematic process for investigating water pollution complaints.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

9. **Key Theme: Forest Crops**

(Reference OSU Plan of Work Extension Program 4H: Forest Specialty Crops)

a. **Description of Activity** - Forest specialty crops, including maple products, Christmas trees, nuts, and herbs offer income opportunities that often exceed typical commercial timber production. In Ohio, both the Christmas tree and maple syrup industries are well-organized and progressive. Both have commodity organizations, the Ohio Christmas Tree Association, and the Ohio Maple Producers Association. Each of these commodities represents several million dollars of sales on an annual basis. A recent research study of the Christmas tree industry indicates that there are over 600 commercial growers in Ohio. The number of maple producers is not well-established due to the difficulties in documenting the production by a large Amish community of producers. Both the Christmas tree growers and maple producers are interested in the application of new production technologies and marketing strategies to their industry as a whole and to their individual operations. Less well-organized are the tree nut and forest herb producers, but nonetheless they are a clientele which is growing in numbers and their desire to receive information and participate in OSU Extension programs.

b. **Impact** - Over 525 participants were involved in forest alternative crops programs. Of this number, 487 were identified as under-served individuals.

-- 315 maple producers participated in the annual Maple Days programs and hobby maple production workshops. They are part of an industry that generates $5 million to the state economy on an annual basis.

-- Christmas tree growers participated in programs on shearing, weed control, fertility, and soil site considerations. These participants represent many of the largest growers in the state where the total industry generates $30 million annually.

-- Representatives from the twenty United States Forest Service -Northeastern Region states participated in a Utilization and Marketing Meeting.

-- OSU Extension Wood Products educators worked with wood processing firms in their participation at the International Woodworking Fair in Atlanta, GA. This effort, in cooperation with Ohio Department of Agriculture and the Piketon Research and Extension Center, resulted in sales of over $150,000 for Ohio companies participating in the Fair.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

10. **Key Theme: Nutrient Management**

j. **Description of Activity** - OSU Extension, working in partnership with the Ohio Livestock Coalition and key state/federal agencies, have developed and implemented the Ohio Livestock Environmental Assurance Program (LEAP). LEAP is helping livestock/poultry producers to profitably manage environmental challenges that are critically important to th e success of their business, and effectively assess how their farmstead practices affect water quality. By OSU Extension providing LEAP certification programs, we will accomplish our primary objective - to promote sustainability by seeking profitable envi ronmental solutions.

k. **Impact** – Ohio's LEAP has exceeded the goal of 2,000 livestock/poultry producers certified by 2000. Over 2,800 Ohio livestock/poultry producers have received certificates of completion and established comprehensive nutrient management plans and expansion phase siting policies.

l. **Source of Federal Funds** – Smith-Lever 3b&c

m. **Scope of Impact** – State Specific

Goal 5. Enhanced Economic Opportunity and Quality of Life

Executive Summary

Enhanced economic and educational opportunities lead to improved quality of life, broadly defined. Much of the previous discussion in this report is devoted to improving economic opportunities as well as e nhancing the environment for rural Americans. In addition, research is needed on how to guide consumers on making the most rational choices to preserve and increase their economic position.

Goal 5 Key Themes

1. **Key Theme: Impact of Change on Rural Communities**

(Reference OSU Plan of Work Research Program 5Br: Rural/Urban Interface)

a. **Description of Activity** - From 1954 to 1992, Ohio lost 24 percent of its farm land to other uses, significant in a state with more than half its land in prime soils. Public debate related to the future of agriculture in Ohio includes land use issues and th e rural-urban interface. Programs that foster orderly development of urban areas and encourage preservation of farms and other unique features such as wetlands are important. Further efforts in this arena should examine economic and social consequences o f alternative public policies that guide the use of land, water, and other natural resources. In addition to the land resource issue, there is also the issue of compatibility of farm and rural non - farm

residents. A rising share of rural, non-farm residents lacks rural background of any kind. In addition, many farm households get the majority, if not all, of their income from non-farm sources and occupy their residence as a home as a matter of preference. Hence their motifs and circumstances are very similar to those of rural non-farm residents. Both are allied in their feelings that they do not want change in the present character of their community. Thus, conflict, when it emerges, is less likely to be farm versus non-farm than it is to be home and family in alliance together and in opposition to changes from any source that would disturb present community character, whether the change is agricultural, commercial, or industrial. A major local issue erupted recently when the U.S. Fish and Wildlife Service proposed that it purchase land and development rights to establish a Darby Creek Wildlife Refuge. While local rural residents adamantly opposed the establishment of a wildlife refuge on 50,000 acres, a detailed analysis showed that it would have very little impact on employment, income and government revenue in the region's total economy.

b. **Impact** - This research, conducted by faculty at The Ohio State University, provided credible, unbiased information to both sides of the controversy which helped to defuse a very emotional issue.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

2. Key Theme: Other - Quality of Life

(Reference OSU Plan of Work Research Program 5D: Quality of Life)

a. **Description of Activities** - Today's world dramatic social and technological changes are profoundly affecting the lives of Ohioans, all families and communities, urban and rural, large and small, face challenges to economic well being and quality of life. Whether encountering issues such as buying a home, saving for retirement, starting a business, or finding their way through new paths created by recent economic reforms, individuals and families of all economic levels require guidance and information in making good decisions. Similarly, quality of life is constantly challenged in this increasingly complex society as more members of a family enter the workforce, as more stress is exerted on relationships, as health and wellness are threatened by illness, trauma or pressure, as children, teens, adults, and senior citizens experience the challenge of living in today's world. Whether encountering issues such as parenting skills, teen pregnancies, stress management, coping with illness or divorce, living in a blended family, serving as a care giver, or balancing work and family, individuals and families of all economic levels require guidance and information in dealing with an increasingly complex world.

Whether families are urban or rural, quality of life issues revolves around economic stability, personal and mental health and family life. Studies have revealed that the average family in the 1990s spent $57 per child for every $100 per adult. This ratio increased with householder education and decreased with household income.

b. **Impact** - Economic and educational opportunities are directly tied to quality of life for rural as well as urban Americans.

c. **Source of Federal Funds** - Hatch

d. **Scope of Impact** - State Specific

3. **Key Theme: Community Development**

(Reference OSU Plan of Work Extension Program 5E: Community Economic Well-Being)

a. **Description of Activities** - Community Economic Development agriculture value-added projects are important to the economic health of many farm producers. Contributions to value-added projects include assistance in creation of roadside markets, roadside marketing conferences and other research and education projects.

b. **Impact** - A roadside marketing directory was created with a distribution of 8,000. Approximately 2,000 of these individuals were under-served individuals and 4,000 were under-represented individuals. Another county collected several thousand dollars to fund vouchers of residents of senior citizen centers to be used at regular weekly visits to various roadside markets. This gave additional economic activity to the markets as well as an opportunity for senior citizens to tour other areas in the county.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

4. Key Theme - Jobs/Employment

(Reference OSU Plan of Work Extension Program 5E: Community Economic Well-Being)

a. **Description of Activities** - Community Economic Development includes efforts working with local government leaders developing private/public partnership for job creation. In addition to the 18 full-time Community Economic Development Agents in Ohio, many dual program Extension professionals also contribute to this effort. Work reported here include general economic development, community marketing, business attraction, business retention and expansion programs, development of infrastructure and assisting communities in developing grant applications. These efforts represent approximately 20 individual reports. In addition, there were 4 reports working with entrepreneurship and youth, an unemployment study, general economic development plan, wage benefits urveys, and one agricultural value-added project in addition to several others.

b. **Impacts** - The total number of participants in Jobs/Employment were 8,945. This includes 4,687 under-served individuals. And 2,906 under-represented individuals. There were 3,727 volunteers (including local boards and advisory committees) participating in the planning and implementation of the various programs and 19 multi-state partnerships were reported as associated with these programs. There were 113 new businesses either started or expanded as a result of these programs. Number of new jobs were 1,342. Thirteen

communities conducted business retention and expansion programs and 8 conducted wage/benefit surveys. There were 28 industrial sites either created or better prepared through infrastructure improvements.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

1. **Key Theme - Community Development (Leadership)**

(Reference OSU Plan of Work Extension Program 5F: Community Development)

a. **Description of Activities** - A Community Planning or Community Visioning process to develop widely held goals for the community has been outlined as a priority program for Ohio communities. In these programs an effort is made for every community member wh o wishes to be involved in creating the Community Vision in Action plan. The concepts of assets and capacities of the community are utilized as well as concepts of sustainable development. This includes not only considering the economic impact of develop ment but also the social and environmental impacts to the community.

b. **Impact** - Comprehensive Community Plans were developed in Clinton and Wyandot Counties and Community Strategic Plans were developed in Nobel and Washington Counties in Ohio. In the pilot Sustainable Development Project in Nobel County, over 500 residents shared their vision of a sustainable future for their community by developing lists of 178 items that they currently valued about their community and 143 i tems they hoped would be different for future generations in Nobel County. Total number of participants in the Project was 572 with 423 under-served individuals and 458 as under-represented. There were 35 volunteers participating in the planning and 37 i ndividuals participating in non-formal education programs on economic development.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

6. Key Theme: Community Development

(Reference OSU Plan of Work Extension Program 5F: Community Development)

a. **Description of Activities** - Community Leadership: Elected local government officials often take office without any formal training for the leadership responsibilities they assume once in office. Most elected officials have received on the job training as they have worked their way through community civic and political processes. However, once in office they are faced with a number of challenges relati ng to the way they conduct themselves in office. In a series of dialogue sessions between Ohio State University Extension Community Development representatives and directors from the County Commissioners' Association of Ohio, the Ohio Municipal League, and the Ohio Township Association, representing a combined total of more than 7,000 local elected officials, an Ohio Local Government

Leadership Academy was created to provide a structured learning experience for local elected leaders. The curriculum was ne gotiated among the participating parties and concluded with the development of ten courses for elected officials.

b. **Impact** - Since the creation of the program in January 2000, two hundred and forty local officials have participated in the program. From the feed back from participants, elected officials indicated they had developed many new ideas for implementation in their local communities. The evaluations from the program showed high levels of satisfaction with the training. It is too early in the cycle and too few individuals have participated to fully assess the impact that the training wil l have upon the way local officials will change the way public business is conducted.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

6. **Key Theme - Community Development**

(Reference OSU Plan of Work Extension Programs 5F: Community Development and 5H: Land Use Issues)

a. **Description of Activities** - Land Use Issues: During the calendar year 2000, Extension agents and specialists assisted public officials, community leaders and the general public in eleven counties that were dealing with land use issues. The 11 counties receiving special attention were Auglaize, Champaign, Clermont, Delaware, Fayet te, Holmes, Montgomery, Muskingum, Stark, Wood and Wyandot Counties in Ohio. In addition to providing professional support to a number of Farmland Preservation Task Forces, information was provided on land use planning and farmland preservation tools such as conservation easements. In Wood County an innovative effort to bring together the local leadership in the areas of land use planning and agricultural economic development was undertaken.

b. **Impact** - Attendance at the various meetings held on land use issues was over 1,200 people. Specific outcomes of Extension land-use programs include a comprehensive preservation plan in Delaware County, the placement of a conservation easement on a major parcel of land in Montgomery County, and plans for the establishment of a new land trust in the Miami Valley. To provide additional support to local public officials, a land use resource directory has been prepared and posted on the web. In six of the counties work is now under way on new comprehensive plans and/or zoning ordinances.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

8. **Key Theme - Community Development**

(Reference OSU Plan of Work Extension Program 5F: Community Development)

a. **Description of Activities** - Public Issues Education: A state specialist working with the Columbus Health Department and the Mid-Ohio Regional Planning Commission has

designed an innovative public participation process as part of Project CLEAR. The three-year project is a pro-active effort to develop ozone reduction strategies in anticipation of EPA mandates to lower ozone levels in central Ohio. The public participation component of the project involves a discussion guide and a series of deliberative public forums designed to both educate people about the complexity of the ozone problem and elicit their ideas for ozone reduction.

b. **Impacts** - A 17-page discussion guide has been written and produced for use in the deliberative forums. During 2000, two forums were held, with over 25 more scheduled for the first six months of 2001. The Project Steering Committee, comprised of public officials and representatives of the industrial, commercial and environmental sectors, has expressed its approval of the very innovative approach being used to get public input.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

9. **Key Theme - Leadership Training and Development**

(Reference OSU Plan of Work Extension Program 5F: Community Development)

a. **Description of Activities** - Community Economic Development Programs and Workshops are conducted for public officials and community leaders to better prepare them for public/private partnerships and for the retention and expansion of business, attraction of business, creation of new businesses, capturing the retail dollar in the community and maximizing intergovernmental transfer payments for the economic benefit of the individual community.

b. **Impact** - A total of 548 public officials and community leaders participated in one or more economic development training programs/workshops who plan to adopt one or more recommended practices to improve the economic development climate of their community.

c. **Source of Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

10. **Key Theme: Family Resource Management**

(Reference OSU Plan of Work Extension Program 5G: Management of Economic Resources)

a. **Description of Activities** - Families in Ohio cope with a multitude of stressors of everyday life, and many of these challenges tax families undue amounts. OSU Extension provides family financial resource management programs and resources like Money 2000, Master

Money Manager Program, Family Nutrition Program, Women's Financial Information Program, and Master Clothing Education Program as a means to educate families on debt reduction, savings, tax preparation, home and small business development, management of housing and clothing resources, and retirement and estate planning.

b. **Impact** - Eighty-nine educational sessions were held with two or more of the 3,186 participants in this program. Of these individuals, 713 were defined as under-served individuals. Financial information displays were developed and used at work site fairs and at other educational activities. Ten issues of a newsletter, "LifeTime" were written and distributed to county FCS professionals for distribution to appropriate residents and the newsletters are located at http://www.ag.ohio-state.edu/~lifework/ . FCS professionals reported 89 educational sessions with 2,074 participants in twenty counties. Of these participants, 62 percent reported learning new information, 34 percent reported intentions of adopting one or more recommended practices, and 1 percent reported actually adopting one or more of the recommended practices as a result of the education program.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

11. **Key Theme - Tourism**

(Reference OSU Plan of Work Extension Program 5I: Business Efficiency)

a. **Description of Activities** - Tourism development is one major focus of the Ohio community economic development program. Tourism is important in Ohio with over ten billion dollars in primary economic activity. Many of our programs reported in other places such as small business development and management assist tourism. Extension tourism programs are often focused on the 29 Appalachian counties of Ohio based upon the natural resources of the area. It is also the area of the state where unemployment is highest and income levels are below the state average.

b. **Impact** - A total of eight, new tourism enterprises were created as a result of OSU Extension programs. The total number of jobs and other data are reported under the general community economic development indicators above.

c. **Source of Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

12. **Key Theme - Farm Safety**

(Reference OSU Plan of Work Extension Program 5J: Work/Life/Health Issues)

a. **Description of Activities** - Community and Farm Safety. Safety is a priority program for Amish families due to the relative high incidence of buggy accidents and serious farm accidents. A program was developed to target Amish buggy drivers and their families. This program was conducted in community events and through the Amish schools. Special

Amish safety programs including marketing of buggies with reflective materials were also developed. Meetings were conducted with Amish Bishops to determine what would be acceptable or unacceptable due to religious convictions with various markings and use of lights on Amish buggies.

b. **Impacts** - A total of 1,900 people participated in the programs and 1,900 people were defined as under-represented individuals in Extension education programs.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

13. **Key Theme: Literacy**

(Reference OSU Plan of Work Extension Program 5K: Positive Youth Development)

a. **Description of Activities** - The overall goal of the Read & Succeed pilot program is to design and implement literacy activities into new community-based programs and existing 4-H programming efforts in four Ohio counties, both rural and urban. Specifically, Extension staff sought to: 1) Increase the number of teen and adult volunteers involved in Extension coordinated literacy education programs; 2) Involve a minimum of 1,000 youth, grades K-4, in the four pilot counties; 3) Increase participating children's attitudes toward and interest in reading; and 4) Increase adult/older teen involvement in reading to/with participating children.

b. **Impact** - In Hancock County, Ohio, 65 percent of the youth, participating in a minimum of 20 hours of literacy activities, showed an improvement in attitude towards reading based on pre- and post-test results. 100 percent of participating school teachers have requested that volunteers return to their classrooms. Fifty-five additional volunteers have been recruited and nine new schools will be participating in the coming year. In Lorain County, pre-test results indicated that 62 percent of participants had read a book in the past week, compared to post-test (after 20 hours of participation) of 91 percent of youth having read a book in the past week. Additionally, pre-test results showed that 13 percent of youth were read to compared to post-test of 34 percent having a book read to them by a parent/adult in the past week. Pre- and post-test results show that 10 percent of youth increased their overall interest and attitude towards reading as a result of participating in the Read & Succeed program. During the 2000 school year, Ohio State University Extension staff and volunteers in Cuyahoga County provided book reading and small group activities to targeted grade levels in an elementary school. 55 percent of youth passed their reading proficiency tests in this grade level, during 2000, compared to 19 percent passing in 1999. Participation in the Read & Succeed program may have provided additional support for these youth to be successful on annual proficiency tests. Pre- and post-test results on overall attitude and interest in reading remained consistent after the 20 hours of participation. In Belmont County, overall pre- and post-test results showed that students remained consistent in their interest and attitude towards reading. However, noticeable

increases in youths active participation in reading, homework completion, and dial ogue were documented.

c. **Source of Federal Funding** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

14. **Key Theme: Youth Development/4-H**

(Reference OSU Plan of Work Extension Program 5K: Positive Youth Development)

a. Description of Activities - In Ohio, 81,076 youth participated in organized community clubs, 73,923 youth participated in special interest and day camp programs, 29,941 youth participated in resident camps, 99,214 youth participated in school enrichment opportunities, and 1,861 youth participated in other designated 4-H program.

b. **Impact** - 4-H youth participants enrolled in over 335,000 individual projects as a result of their involvement. Youth participated in a variety of educational clinics and in -services to increase their subject matters and life skills development. More specifically, youth gained marketable skills, participated in community service projects, and increased their appreciation of diversity.

c. **Source of Federal Funding** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

15. **Key Theme: Parenting**

(Reference OSU Plan of Work Extension Program 5L: Parenting and Family Life)

a. **Description of Activities** - Today's families face many challenges such as divorce, family violence, teen pregnancies, and general parenting issues. Parents need to learn skills to help them nurture and guide youth from infancy through adolescence and beyon d as well as nurturing themselves.

b. **Impact** - Three state specialist positions were filled to give leadership to OSU Extension programming to this goal. A Positive Parenting Newsletter is distributed statewide 6 times per year to approximately 150,000 parents. A Family Life Month Packet and an Older Americans Month Packet are developed as resources for those doing programming targeting parents and families. FCS Agents reported 25,388 participants at programs targeting family life, including parenting, issues. Of those, 13,464 were defined as under -served populations. A significant number of the participants were from court mandated programs and from programs developed in collaboration with other agencies and organizations and that targeted families at risk. Seven hundred fifty four volunteers contributed time to the goal. Agents conducted 2,263 educational programs with 16,677 participants. Of these, 93 percent learned new information from the program, 61 percent planned to adopt one or more recommended practices as a result of the education program,

and 32 percent reported adopting one or more recommended practices as a result of the education program.

c. **Source of Federal Funds** - Smith-Lever 3b&c

d. **Scope of Impact** - State Specific

Stakeholder Input Process

The College of Food, Agricultural, and Environmental Sciences of The Ohio State University was awarded a grant from the W. K. Kellogg Foundation to conduct a process that would create: 1) a new vision for food systems education, with implications for changes in land-grant universities and higher education across the country; 2) new structures for engaging citizens in vision building, decision making, and agenda setting; and 3) new models for educational responsiveness to constituent needs. The process entitled "Project Reinvent" brought together, through 18 focus group sessions, more than 230 individuals from the College, the University, and citizens of the State of Ohio to gather their views on what the College of Food, Agricultural, and Environmental Sciences must become to most effectively serve the needs of the people of Ohio and meet the challenge of the 21th century. External stakeholder groups participating in the focus sessions included farmers and producers, consumer and food advocacy/health care, food processors and retailers, agribusiness suppliers, commodity groups, environmental and natural resources groups, sustainable agriculture groups, legislators, primary and secondary educators, entrepreneurs/new technology, rural economic development groups, and media.

Some key highlights resulting from the focus groups input includes:

– The College adopted a new vision statement that would drive future decisions and an implementation grant was secured. Four teams were formed to address system change issues in:
  - Organizational structure
  - Reward system
  - Programmatic focus
  - Communication and marketing

-- A team was formed to create a strategic plan for the Ohio Agricultural Research and Development Center, encompassing the Columbus and Wooster campuses and the 10 branch stations. In May 1998 the team presented the first phase of a strategic planning process, which identified a number of strategic issues and a series of experimental efforts to address those issues.

-- Integrated systems approach identified and adopted as the foundation of the efforts within the College. The College recognizes that to sustain agricultural practices in the future the efforts must address issues of 1) production efficiency, 2) economic viability, 3) environmental compatibility, and 4) social acceptability in an integrated manner.

– A group of college and community leaders were brought together to serve as an ongoing advisory council to the Vice President and Dean of the College on issues that have widespread impact and implications for the College, its many units, and the full spectrum of audiences.

– An OARDC Internal Competitive Grants Program that matches funds from industry and other stakeholders with OARDC funds.

And the stakeholder input process continues. The Ohio Agricultural Research and Development Center and most academic departments have external advisory boards that meet at least quarterly to discuss current programs and provide input for future direction. Within the past 6 months in excess of 60 meetings have been held throughout Ohio with state legislators, community lay leaders, and representatives of Ohio State University Extension and OARDC to dialog on current educational and research programs and converse on future programs.

Program Review Process

Merit Review

(Note: The merit review process has not changed in FY 2000.)

OSU Extension develops long range program plans through a process involving Extension personnel from throughout the system, input of lay leaders in communities, incorporating data about Ohio's population, and through collaboration with other agencies, institutions and organizations.

Each of the four program areas conducts long range strategic planning to prioritize programming. Specialists from academic disciplines provide insight from research trends while county Extension personnel provide insight from local communities. Systema tic prioritization processes, such as Delphi, are used. Program areas work together to identify key issues that cut across disciplines. Special task forces or teams then collaborate to identify priority program efforts to address these issues. Funding i s then allocated to support program priorities. Programmatic resources such as personnel or materials reflect the program priorities. In addition, these priorities direct from what sources grant funds are sought.

Once strategic plans are in place, there is continual review of plans to include the ability to be responsive to unanticipated issues. The system provides flexibility for agents to address these issues. In situations where grant monies are obtained, staff with specific, short-term employment contracts are hired to assist in meeting priority needs.

Agent specialization is a way for the system to provide subject matter expertise close to local communities. Agents determine a subject matter specialization that relates to needs in their geographi cal area of the state. They receive additional training to remain on the cutting edge of their field. They are encouraged to work with other agents in their district to address local needs in a timely manner. In addition, agents are linked to state specialists in the same discipline to enable the rapid dissemination of new information or the development of appropriate programming to address critical needs.

Scientific Peer Review

(Note: The scientific peer review process has not changed in FY 2000.)

Base funds (Hatch, McIntire Stennis, Animal Health) allocated to OARDC undergo an extensive review process within the OARDC system. The following describes the review process:

- Project proposals are initiated by research faculty and research scientists in consultation with colleagues and Department or Program chairs.
- Chairs review all proposals. Chairs are responsible for selecting at least two peer reviewers for each proposal. The reviewers are expected to have expertise in the subject matter area and can be from on campus or off-campus. The reviewers evaluate, recommend, and comment on each proposal.
- Reviews are returned to the proposing scientist who them responds to suggestions, makes changes, and resubmits the proposal to the Chair.
- Chairs indicate departmental approval by signing the AD-416.
- Following review and approval by Chairs, proposals are forwarded to the Experiment Station Director's Office where they are reviewed for accuracy in coding and format and concurrence with State Experiment Station and CSREES program directions. Revisions are requested if proposals are incomplete, are not sufficiently justified, or documented.
- Upon approval by the Director or his/her designee, projects are assigned a number and are electronically forwarded to CSREES for approval and inclusion into the Current Research Information System (CRIS). The Experiment Station Fiscal Office is notified of all approved projects wherein the Fiscal Office maintains records of expenditures to be used in the AD-419 and the Annual Report which are submitted to CSREES. The Experiment Station publishes the Annual Report to document and distribute scientific accomplishments and impacts.

Evaluation of the Success of Multi and Joint Activities

Agriculture and Natural Resource Extension Programs

Over the past two years, Ohio State Extension's Agriculture and Natural Resources (Ag/NR) program area has provided strong leadership to engage our 21 Commodity and Issue Teams to network with neighboring land grant universities. Within our annual report, we have profiled just a few of the very successful high profile programs, products and activities that are better leveraging our Federal, State, and County dollars to serve our very diverse industries and clientele. During the program year for 2000, the Ag/NR Teams and Departments accounted for over 65 different Multi-State programs and conferences held across the North Central Region and Country.

Evaluations conducted by our multi-state committees and Teams have indicated that they feel that Multi-state conferences create improved learning opportunities and also better complement the disciplinestrengths of each institution. Many of our conferences and educational products have developed a strong tradition of support from clientele throughout the entire region. It is our vision to continue to provide a supportive environment to our Extension Field and State Faculties that will build upon these successful multi-state ventures.

Research Activities from a Research Perspective

Multidisciplinary research teams have been formed to address critical issues. The Agroecosystems Management Team brings together stakeholders and those involved in research, teaching and outreach from

different disciplines and institutions to discuss and develop whole systems approaches to the challenges affecting agriculture and rural communities. Its activities include p ublic seminars on system research, sustainable agriculture and agroecosystems, sponsorship of stakeholder initiated workshops on sustainable management practices, and support of local learning communities. A practical management guide that relates basic principles of ecosystems based management to specifics of crop and livestock production has been produced. Educational materials have been developed for grade K-12.

The Ohio Compost and Manure Management Team was formed to build focus on issues and system technologies leading to safe, economic utilization of livestock manure with minimum odors and nutrient losses to water supplies. A video linked seminar series addressing manure management issues followed by discussion increased communication among stakeholders and provided an opportunity for networking with researchers and policy-makers. Organized tours of livestock and composting facilities that demonstrated effective waste management were conducted. A field day highlighting construction of a composting pad and treatment wetlands was attended by approximately 100 individuals. A website that highlights OCAMM goals, activities, seminar summaries, and link to sites with relevant information was developed.

Ohio State researchers were participants on three multi state research proposals that secured Initiative for Future Agriculture and Food Systems funding.

Multi-state Extension Activities

1. Key Theme: Agricultural Communication

a. **Description of Activity** - The *Agricultural Outlook* is a multi-state effort (Purdue-Illinois-Ohio) to provide a comprehensive and timely hard copy commodity outlook guide for the Eastern Corn Belt farmers and Agri-business professionals. Lead editors from each state choose the various commodity experts in each participating state to provide both a short and long term outlook for commodities of major economic importance to this region. Each year, as many as twelve authors from the three participating states will produce this very timely and high demand publication.

b. **Impact** - Agriculture Economists in Indiana, Illinois and Ohio prepared a 16-page annual Outlook publication which was inserted in the issue of the Prairie Farmer which is published/circulated in each state. The potential readership of farmer and allied industry personnel is over 200,000 subscribers.

c. **Source of Federal Funds** - Smith-Lever 3b&c

2. Key Theme: Human Health

a. **Description of Activity** - The mission of the Healthy People/Healthy Communities national health initiative is to promote the capacity of individuals, families, and communities to increase healthy behaviors and lifestyle choices and make informed consumer decisions. The initiative strengthens community leadership, and promotes the formation and enhancement of

quality partnerships and infrastructures to meet local health and health care needs. The initiative brings together the extension, teaching, and research resources of the land - grant university system and its stakeholders to address health care issues.

b. **Impact** -

c. **Source of Federal Funds** - Smith-Lever 3b&c

3. **Key Theme: Agricultural Communications**

a. **Description of Activity** - Purdue/DTN Agreement (Electronic News Service) - This partnership is a joint effort to disseminate timely management/marketing information aimed at larger scale commercial farmers across the Eastern Corn Belt through the most widely subscribed farmer information network. Both Purdue and Ohio State University specialist s and research faculty on a daily rotation provide articles on contemporary crop and livestock production.

b. **Impact** - Both Indiana and Ohio cooperated in disseminating production oriented ag news, research results, contemporary advice from production extension specialists and AG/NR agents, and updated calendar event information to producers via electronic news systems.

c. **Source of Federal Funds** - Smith-Lever 3b&c

1. **Key Theme: Agricultural Profitability**

a. **Description of Activities** - The Tri-State Dairy Nutrition and Management program effort provides an annual educational forum aimed at larger scale professional dairy producers and many professional industry consultants across the Eastern Corn Belt dairy region. Educational agendas range from the latest diet formulation software programs to recr uiting and retaining new dairy farm employees and neighbor relations.

b. **Impact - Dairy and Veterinary Extension Specialists from Indiana, Michigan** and Ohio developed and conducted two educational dairy conferences focusing on contemporary nutrition and efficient management systems. Conferences focused educational agendas toward highly competitive dairy managers and professional allied industry (veterinarians, nutrition and reproductive specialists and herd consultants).

c. **Source of Federal Funds** - Smith-Lever 3b&c

5. Key Theme: Water Quality

a. **Description of Activities** - Wastewater Treatment Alternatives for Small Communities - Small communities are facing the prospect of complying with the federal Clean Water Act to eliminate the discharge of pollutants to navigable waters of the US. Cost to build sewer systems and treatment plants to serve small communities exceed $2,000,000 per every 100 houses. Fortunately, small communities have other alternatives to eliminate the discharge of pollutants while still reducing costs. This program teaches local officials, professionals, regulators, property owners what they need to know to make these expensive and sometimes confusing decisions. Current collaborations include Indiana and New Mexico.

b. **Impact** - In 2000, OSU Extension worked with New Mexico on infrastucture Financing. In addition, the new concept of onsite wastewater management was summarized in two new fact sheets AEX 750 and AEX 751. And the topic was also presented at the National Onsite Wastewater Recycling Association meeting in Michigan in October 2000. As a result of the presentation in Michigan, OSU Extension was invited to teach the topic in Utah and Minnesota in January 2001 and finally in Pennsylvania later in 2001.

c. **Source of Federal Funds** - Smith-Lever 3b&c

Integrated Research and Extension Activities

1. Key Theme: Workforce Preparation - Youth and Adult

a. **Description of Activity** - Workforce Preparation Across the Life Span program incorporates the multi-state project, "Rural Low-Income Families: Tracking their Well-Being and Functioning in the Context of Welfare Reform." The principal investigator in Ohio is Sharon Seiling. The other states involved are California, Colorado, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New York, Ohio, Oregon, Utah, Wyoming.
This is a research study of rural low-income mothers with at least one child age 12 or under. The study will assess the impact of welfare reform on their lives and on the community. Each state is interviewing 20-40 mothers in one or two counties. In Ohio, the investigators are interviewing participants in Hardin County. From the qualitative and quantitative data collected on these families, the research will provide insights to agencies and policy makers in Hardin County, the state of Ohio and the other states regarding family well-being and functioning within their rural communities.

As part of the study in Ohio, government officials and agency representatives, employers, and non-profit agency representatives will be interviewed about the implementation of welfare reform in the community. The data will be analyzed to compare the responses from the families to those of the community leaders, to more fully understand the issues and to assist in better meeting the needs of low-income families in rural counties in Ohio.

b. **Impact** -

c. **Source of Federal Funds** - Smith-Lever 3b&c

2. **Key Theme: Human Nutrition**

a. **Description of Activity** - The Nutrition Education for Limited Resource Audiences: Food Safety Education Validation Study. Educators in the area of food safety have identified a need for developing valid and reliable evaluation instruments for determining the effectiveness of their education efforts, particularly with limited resource a udiences. This tri-state USDA funded grant project involves Cooperative Extension researchers in food safety education from Ohio State, Washington State and Colorado State Universities. The primary objectives of this study are three-fold:

1. Identify key behaviors needed to prevent food borne illness arising from home food preparation techniques, and use these behaviors to develop effective food safety education programs within Cooperative Extension.
2. To design and test an evaluation questionnaire, that will accurately assess food safety behaviors among low-literacy and/or low-income audiences.
3. Evaluate whether self-reported behavior changes are a valid way to assess the behavioral outcomes of food safety education.

b. **Impact** -

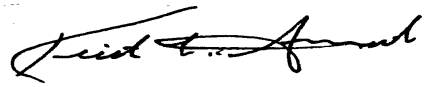
c. **Source of Federal Funds** - Smith-Lever 3b&c

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities

Institution_The Ohio State University
State_Ohio

Check one: __X_ Multistate Extension Activities
____ Integrated Activities (Hatch Act Funds)
____ Integrated Activities (Smith-Lever Act Funds)

	Actual Expenditures				
Title of Planned Program/Activity	**FY 2000**	**FY 2001**	**FY 2002**	**FY 2003**	**FY 2004**
Electronic News Service	**$37,969**				
Agricultural Outlook	**53,235**				
Tri-State Dairy Nutrition & Management	**51,240**				
Wastewater Treatments for Small Communities	**3,876**				
Healthy People/Healthy Communities	**2,733**				
Total	*				



_____ __April 3, 2001_____
Director Date

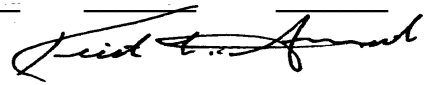
*** NOTE: Due to unforeseen circumstances associated with the launch of our new reporting system and the date this report is due, some data are incomplete. Therefore, we are asking for a waiver until such time we can give more accurate totals.**

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities

Institution_The Ohio State University
State_Ohio

Check one: ____ Multistate Extension Activities
____ Integrated Activities (Hatch Act Funds)
_X__Integrated Activities (Smith-Lever Act Funds)

	Actual Expenditures				
Title of Planned Program/Activity	**FY 2000**	**FY 2001**	**FY 2002**	**FY 2003**	**FY 2004**
Workforce Preparation Across the Life Span	**$7,567**				
Agricultural Outlook	**39,245**				
Tri-State Dairy Nutrition & Management	**25,620**				
Wastewater Treatments for Small Communities	**3,876**				
Nutrition Education for Limited Resource Audiences	**3,740**				
Total	*****				



_____ __April 3, 2001_____
Director Date

*** NOTE: Due to unforeseen circumstances associated with the launch of our new reporting system and the date this report is due, some data are incomplete. Therefore, we are asking for a waiver until such time we can give more accurate totals.**

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Request for Waiver from Target Percentage
for Multistate Extension Activities and Integrated Activities

Institution_The Ohio State University_
State__Ohio_

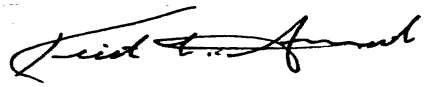
Waiver for (circle one): **Multistate Extension Activities ✔**
Integrated Activities (Hatch Act Funds)
Integrated Activities (Smith-Lever Act Funds)

Fiscal Year (circle one): **FY 2000 ✔**
FY 2001
FY 2002
FY 2003
FY 2004

Type of Waiver: **Pre-waiver (Must be submitted prior to October 1)**
Post-waiver ✔ (Must be submitted with Annual Report of Accomplishments and Results)

Justification:

The College of Food, Agricultural, and Environmental Sciences of The Ohio State University is updating its reporting system and as a result, data required for both multistate and integrated research and extension are not fully available at this time. We are asking for a waiver until we can fully document multistate and integrated research and extension required for AREERA Reports of Accomplishment and Results.



_____ ___ April 3, 2001_____
Director **Date**

Note: All reports must be submitted regardless of request for waiver.

Form CSREES-WAIVER (2/00)

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Request for Waiver from Target Percentage
for Multistate Extension Activities and Integrated Activities

Institution_The Ohio State University_
State__Ohio

Waiver for (check one): **Multistate Extension Activities**
Integrated Activities (Hatch Act Funds)
Integrated Activities (Smith-Lever Act Funds) ✔

Fiscal Year (circle one): **FY 2000 ✔**
FY 2001
FY 2002
FY 2003
FY 2004

Type of Waiver: **Pre-waiver (Must be submitted prior to October 1)**
✔ Post-waiver (Must be submitted with Annual Report of Accomplishments and Results)

Justification:

The College of Food, Agricultural, and Environmental Sciences of The Ohio State University is updating its reporting system and as a result, data required for both multistate and integrated research and extension are not fully available at this time. We are asking for a waiver until we can fully document multistate and integrated research and extension required for AREERA Reports of Accomplishment and Results.

_____ **_____April 3, 2001_____**
Director **Date**

Note: All reports must be submitted regardless of request for waiver.

Form CSREES-WAIVER (2/00)