# Cornell University
# FY04 Annual Report for Agricultural Research and Extension Formula Funds

Cornell University Agricultural Experiment Station
NYS Agricultural Experiment Station
Cornell Cooperative Extension
College of Agriculture and Life Sciences
College of Human Ecology
College of Veterinary Medicine

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**FY2004 Annual Report**
**Cornell University**

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## Background and Methods

**Planning Option:** Statewide activities -- integrated research and extension plan.

**Period Covered:** October 1, 2003 through September 30, 2004

### Program Definition and Scope

This report directly reflects our approved plan of work. As indicated in our approved plan, all program descriptions were framed as ongoing major programs. We have not, therefore, separated results into timeframe categories (short-term, near-term, long-term). Data and narrative documentation were collected for the indicators included in our approved plan of work and supplement.

### Methodology and General Comments

A variety of data sources and documentation procedures were used to generate this report. For extension, the primary sources were system-wide annual accountability reports and fiscal and personnel accounting records. The annual reports include participation data, reports against our approved performance indicators, and program impact statements. For research, The CRIS reporting system, annual faculty activity reports, and fiscal and personnel accounting records were the primary sources.

Our documentation approach reflects the approved plan directly. For example, as outlined in the plan supplement, we used joint extension/research appointments as direct evidence of integrated activity and rely on personnel accounting for documentation. In the case of multi-state extension activity, we relied on project proposal ear-marking and direct reports by faculty on a project-by-project basis. With final approval of our plan and supplement, we included appropriate indicators in our on-line project documentation and reporting structures to facilitate reporting. For example, persons submitting preproposals for both Hatch and S-L funding now are expected to address the integrated activity and multistate extension components of the proposed work.

For each of the five goals, we provide indicator, expenditure and effort data to reflect the scope and reach of programming in that area. Also included are selected impact statements to convey the nature of programming within each goal area. For each of the indicators, we report results for FY 2004 followed by the plan of work target result. Most extension indicators were met or exceeded, some of them significantly. One indicator not met, 5.4.2, deals with parenting education and reflects reduction of campus-based program leadership in this area. The four remaining indicators not met (1.3.1, 3.5.1, 4.3.1, and 5.1.2) all deal with policy education the reduced numbers, in part, reflect a shift from broad community awareness activities to focused work with decisionmakers. For an example of this approach, see the “Transfer of Development Rights” impact statement on page 11. While the effort influences thousands of county residents, we “claimed” only those local officials with whom we worked directly.

We did not attempt to communicate in detail the work within or across goals. Rather, we selected examples to provide a broad view of our efforts related to each goal. This approach is best illustrated by our use of impact statement data. We received over 600 impact statements from research and

extension faculty and off-campus educators via annual reporting. The scope of those reports obviously is very broad. We selected only 35 impact statements from both research and extension that we felt best illustrated primary themes of our work for 2004. While priority was placed on examples that include documented outcomes and impacts, we have included a few that describe promising new initiatives as evidence of the dynamic nature of our programming. It should be noted that the impact statements included reflect both federal formula funds and associated matching and/or supplemental funding. In most cases, Smith-Lever and Hatch funding is significantly enhanced by other sources in carrying out any given project.

The process for receiving and considering input from stakeholders, described in Cornell University's 5-Year Plan of Work and in the Annual Reports of Accomplishments and Results, also pertains to projects supported by McIntire-Stennis and Animal Health and Disease research funds. The Stakeholder Involvement section outlines how our program development process is enhancing our long tradition of effective stakeholder involvement. Our approaches for stakeholder involvement continue to evolve based on feedback from participants. Note that at least 8 of the impact examples included in this report include specific efforts to reach underserved populations (Improved Field Corn Hybrids for Organic Producers, Food Safety Training for Vocational Education Culinary Arts Program, Multistate Research Documents Rural Family Nutritional Issues, Eat Smart New York, Research Finds That Environmental Risk Factors May Have Life-Long Effects On Children in Low-Income Families, Rural Youth Employment, and, Job Placement and Employment Project).

**GOAL 1 – AN AGRICULTURAL PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY**

Agricultural production systems in the United States are part of the overall growing global economy of food and fiber products. On a more localized level our production systems are the basis for maintaining the rural economy and providing a safe and nutritious food supply to our diverse population. Our agricultural systems in the northeast are broad and encompass small and large scale plant and animal farming; regional and specialty market production and processing; and, local, national and international marketing. This diversity has enabled our agricultural systems to remain competitive in the global economy. The foundation for this has been our ability to develop and integrate new technology into our agricultural production systems through the combined efforts of fundamental and applied research programs linked with effective extension efforts. However, as the global market changes, we must understand where our opportunities lie.

Although our efforts are extremely diverse, they can be subdivided into the areas of production, protection, processing and marketing.

**Production**

Improving the yield and quality of plants and animals in agricultural production systems is fundamental to improving our ability to compete in a global economy. These improvements can be accomplished through:

0) traditional and modern breeding programs which select for desired traits (such as yield, flavor and pest resistance) and an understanding of how they can be expressed under different environmental regimes;
0) improving our understanding of the nutritional requirements for plants and animals so that inputs and waste products are minimized;
0) improving our understanding of soils in order to maintain or improve the health of the soil;
0) improving our understanding of the impact of environmental conditions on plant and animal production.

**Protection**

Plants and animals are stressed by various organisms including insects, pathogens and weeds. Traditional control of these pests through the application of synthetic pesticides has allowed farmers to manage some of these pests, but concerns about their effects on the environment and the development of resistance must be taken into account. Improvements in protection of our production systems can be accomplished through:

0) genetic engineering of plants to express pesticidal traits and the development of management systems which ensure the durability of the deployment of these plants;
0) utilization and/or improvement of insects and microbes which may act as pesticides against insects, pathogens and weeds;
0) improvements in the production systems for mass producing natural enemies;
0) an improved understanding of the non-target effects of pesticides.

**Processing**

The value of agricultural raw products is multiplied through processing them into foods and fiber which become distributed through wholesale and retail markets traded worldwide. The value of grapes at harvest, for example, is minimal compared with the value of the wines they produce. Improvement of our agricultural production systems on a global market can be achieved through processing which:

0) recovers components from what would be engineering waste and converts them into marketable items (particular enzymes, flavors, bulk materials, etc.);
0) enhances the food product by preserving or increasing the level of nutrients or flavors;
0) maximizes the freshness of the product through minimal processing;
0) minimizes the process of converting the raw product into foods.

**Marketing**

The competitiveness of our agricultural products is influenced by domestic and international factors and an understanding of the production, distribution and marketing costs will influence what agricultural production systems are most competitive for our region. Improvement of our agricultural production systems on a global market can be achieved through: 1) an understanding of the costs for our production systems compared with other domestic and regional production areas; 2) an understanding of the specific desires of the consumers in various regions of the world economy; 3) an understanding of the political, regulatory and social structures which influence the production and distribution of agricultural products which are produced in other regions.

The agricultural production systems of the northeast are diverse. Over the decades some of our systems have lost their relative strengths compared to other regions while other systems have grown in their relative strengths. The majority of the population of the US is centered in the northeast region and the opportunities for agricultural systems should be high. However, presently we import ca. 80% of our food. In many cases this is the result of more favorable agricultural conditions (lower labor costs, longer season, etc.) outside our region. Future research investments should be directed toward those projects which provide us with the best opportunities to compete both nationally and internationally. Dairy systems, floriculture and ornamental and fresh foods are examples of areas in which northeastern agriculture can effectively compete. The growth of community food systems, such as local and roadside markets, should be encouraged as well. For any of these areas, there will continue to be a need to increase research investments in fundamental and applied sciences to improve the production, protection, processing and marketing of our agricultural products so they can be competitive on the regional, national and international markets.

## PERFORMANCE GOALS FOR INITIATIVES RELATED TO GOAL 1

Empower individuals and enterprises in agriculture and food systems to thrive in order to:

- maintain strong, rural communities;
- advance a clean healthy environment;
- promote attractive landscapes;
- assure a safe, nutritious, and abundant local food supply; and
- support a thriving New York State economy.

**Indicator Data Specific to Goal 1**

(For each indicator, both actual and annual target results are included, the latter in parentheses.)

**INDICATOR 1.1** The total number of refereed or peer reviewed articles or materials reporting research on topics related to agricultural production and competitiveness.

| Year | # refereed items | # patents, licenses, varieties |
|---|---|---|
| **2004** | 1026 (675) | 40 (40) |

**OBJECTIVE 1.1** To produce new and value-added agricultural products and commodities.

**INDICATOR 1.1.2** The total number of persons completing non-formal education programs on production of new and value-added commodities and products and the number of these persons who actually adopt one or more recommended practices or technologies within six months after completing one or more of these programs.

| Year | Output: # completing programs | Outcome: # adopting practice/ technology |
|---|---|---|
| **2004** | 6532 (5000) | 3307 (2300) |

**OBJECTIVE 1.2** To annually increase agricultural producer awareness, understanding, and information regarding the production of new and value-added commodities and products in U.S. agriculture.

**INDICATOR 1.2.1** The total number of persons completing non-formal education programs to improve the productivity and global competitiveness of the U.S. agricultural production system and the number of these persons actually adopt one or more new production techniques or strategies within six months of completing one or more of these programs.

| Year | Output: # completing programs | Outcome: # adopting practice or technology |
|---|---|---|
| **2004** | 13,505 (10000) | 7283 (4000) |

**OBJECTIVE 1.3** To improve decision-making on public policies related to the productivity and global competitiveness of the U.S. agricultural production system.

**INDICATOR 1.3.1** The total number of persons annually completing non-formal education programs on topics related to public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system and the number of those persons make use of such knowledge within six months of completing one or more of these programs.

| Year | Output: # completing programs | Outcome: # utilizing information |
|---|---|---|
| **2004** | 4251 (5500) | 2097 (2400) |

**Resources Allocated to Goal 1 (FFF & Match)**

**Dollars x 1000 and (FTE) or (SY)**

| | FY2004 Target | FY2004 Actual |
|---|---|---|
| **Extension** | 3,378 | 3,076 |
| **Total** | (60.9) | (59.3) |
| **Research** | 5,200 | 5,305 |
| **Total** | (34.1) | (66.2) |

## Impact Examples Related to Goal 1

### Breeding Vegetables to Strengthen the Northeast's Agricultural Competitiveness and Environmental Sustainability

Vegetable varieties that have improved levels of disease resistance, insect resistance, and tolerance to abiotic stresses are key to keeping farmers, particularly those in the Northeast, competitive in the marketplace. Such resistant varieties can increase yields while reducing specific crop losses and pesticide application-related costs. Private seed companies' efforts frequently do not serve the needs and interests of the Northeastern farmer.

A plant breeder at Cornell, supported with Hatch project funds, has focused her research program on developing superior and resistant varieties of vegetables for cultivation in the Northeast, including cucurbits (squash, various melons, and pumpkin), peppers, and tomatoes. As these varietal lines have become available to growers directly through their commercial use (and indirectly as a consequence of commercial breeding), reduced pesticide applications and improved yields for growers and quality for consumers have been observed. In 2003, through the Public Seed Initiative, which this scientist directs, additional breeding, using participatory approaches aimed especially at generating advanced disease resistant materials for low input/organic production systems, was launched.

Twenty-five (25) commercial licenses are now in force, confirming that the products of these breeding programs have broad value and impact. Licensees include all the largest seed companies and a number of smaller, more regionally focused companies. Almost 3,000 material transfer agreements are on file, which distribute improved germplasm globally. In summary, this project has generated disease resistant breeding lines and varieties often with significantly improved flavor and yield. The impact of these developments are to reduce environmental consequences of agricultural production especially with regard to pesticide applications, to reduce costs of production, especially important for smaller growers, and to improve food quality and safety for consumers.

### Improved Field Corn Hybrids for Organic Producers

The demand for organic food in the United States has increased by approximately 200 percent over the past 10 years, a trend that is expected to accelerate in the coming decade. Organic farmers in New York State will be better able to capitalize on this trend thanks to efforts of plant breeders at Cornell.

Organic corn and organic corn seed production represents an environmentally-sustainable approach to field crops production in New York and a value-added economic option for the state's crop producers. While organic farmers in New York grow many acres of field corn, most of the seed for their crop comes from out-of-state seed providers. In addition, very little of the seed corn in the United States is currently being grown organically.

With the advent of new National Organic Program rules that require organic crops to be grown from organic seed, farmers in New York State are currently limited to relatively very few non-New York seed outlets. The seed source "bottleneck" represents a challenge, but also a potential opportunity for organic seed corn production and sales by enterprises within state borders. Clearly organic seed corn

can be grown in-state, and resident organic farmers appear ready and willing to undertake such ventures. It also constitutes an opportunity to identify, invest in, and produce varieties that are especially well-suited to New York's environmental and production conditions.

Hatch support has been used by Cornell scientists for germplasm enhancement in maize, evaluation of open-pollinated corn varieties, and other variety evaluations. Baseline efforts supported by federal formula funds have attracted further USDA, private company and Rockefeller Foundation research awards. The research has identified varieties that render improved yields and that are agronomically superior for New York organic corn producers. It has also provided critical information on corn varieties that could be the basis for production and sales of organic corn seed in the state, thus developing the potential for new organic grower business and market opportunities.

Hybrids resulting from Cornell's field corn breeding program will be produced and sold as organic seed in New York in the next few years. As evidence of the recognized potential of this general line of breeding studies at Cornell, in late 2004, CSREES awarded $894,450 to the Organic Seed Partnership (OSP), centered at Cornell, to improve organic seed quality and farm profitability. The grant will help build a large community of growers and breeders in the Northeast who can readily share information gathered from organic seed-breeding field trials.

**Improving Wine Quality and the Economic Viability of New York Wine Producers**

The New York Farm Winery Law, enacted in 1976, allowed state grape growers to produce wine and sell it directly to the consuming public. This law change provided grape farmers in several rural regions of the state with an opportunity to produce and sell a high value-added product. Information was needed, however, on what varieties of grapes to grow, how they might best be grown, how to make wine from chosen grape varieties, and which wines can be made with the most consistent and desirable qualities.

Researchers at Cornell, particularly at its New York State Agricultural Experiment Station in Geneva, have worked to evaluate grape cultivars and growing practices best suited for the State's wine-growing regions. They have also developed new grape varieties that can not only grow well and consistently, year-to-year, in these regions, but can also provide final wine flavor and taste profiles and attributes desired by the consumer.

Since the winery law's passage, Cornell's Enology and Viticulture Programs have been successfully and consistently providing critical information on grape-growing and wine-making to the State's wine industry. The State's winery count has grown from just 9 in 1976 to 206 in 2004, showing a 10 to 15 percent annual growth rate over the last decade. Estimated retail value of all wine produced in the State is now over $1 billion annually. As the wine industry has grown, grape production in the state has shifted from production of lower value juice grapes to high value wine grapes (e.g., a ton of Concord grapes most recently sold for $145-$450, while a ton of Reisling grapes sold for $1400 to $1700). The New York wine industry now directly employs approximately 3700 workers, and the wine-related associated tourism industry may be stimulating up to $7 billion in economic activity each year.

Grape growers and wine producers have benefited directly from Cornell's research and extension efforts. A February 2005 regional forum sponsored by a State Senator heard praise from this legislator and also industry representatives about the critical role played by Cornell researchers and extension educators in wine industry development and growth.

## Developing New Nutrient Guidelines and Strategies for Healthier and More Productive Dairy Stock

Much of the dairy industry worldwide has utilized the same approach to feeding neonatal calves and heifers from birth to post-puberty for the last 30 years. In short, using a low-cost approach to raising stock, dairies have focused on making the calf a ruminant quickly, which meant feeding the calf milk replacer prematurely. Such practices do not meet animal maintenance requirements. This low-cost approach has ignored the biology and nutrient requirements of a neonatal animal and ultimately contributes to greater sickness and mortality. Moreover, beyond feed costs, heifer replacement (as influenced by such factors as how they are reared, the actual physical condition in which they calve, and time to lactation) constitutes the highest cost sector of production. Encouraging more lean growth in the early life of dairy cows and the making of improvements to neonatal animal health can prove advantageous to the dairy farmer and industry as a whole.

Research and discussions with the major U.S. manufacturers of calf milk replacer have resulted in their nearly 100 percent affirmation of a new strategy for the nutritional management of dairy calves. This has resulted in new replacer products and feeding regime instructions that that are significant departures from the historical industry norm. The largest manufacturer of milk replacer (holding about 75% of the market share) now has approximately 20 percent of its sales via a product that follows the new Cornell recommendations. Industry-wide, it is estimated that 20 percent of all calves in the U.S. are now fed according to these new guidelines.

Response from producers that have adopted this neonatal nutritional program has been overwhelmingly positive. Documented benefits include: reduced death loss, reduced antibiotic treatment; lower age at first calving; and in some cases increased first lactation milk yield. All of these outcomes can translate into improved profitability for the dairy producer and industry.

## Farm to School Support Project

Smaller farms in St. Lawrence County sell primarily through direct marketing - farmers markets, roadside stands and a few community supported agriculture ventures. Sales through wholesale outlets, such as retail stores or food service, require individual coordination, mainly through personal contacts for delivery and purchasing. Selling through growers' cooperatives was not an option within the county. Rather, some farmers sell to Finger Lakes Organic, outside of the North Country region.

During the 2002-2003 school year, Potsdam College began buying foods from St. Lawrence County growers, including fresh produce (tomatoes, corn, and carrots) and value-added items (honey and maple syrup). Ordering, distribution and payment were coordinated primarily by the food service manager. Growers contacted the manager directly for sales. While the food service program was eager to support local farms, the added workload of purchasing, accounting, and quality control for

foods and food packaging were major challenges. The desire to purchase fresh local foods in-season by food service establishments and the need for more accessible wholesale opportunities for growers was the impetus for the Farm-to-School Support project.

Funding was sought through the Cornell Small Farms Program. This grant was used to involve a diversity of farms/farmers in the county in a series of winter meetings on production for a wholesale market. The meetings provided an overview of the Farm to School Program, an opportunity for networking among farmers, and availability of local and statewide resources on small-scale vegetable production.

As a result of these efforts, 31 farmers signed up as member growers for the 2004 Farm-to-School Support Project and an organizing effort for a local marketing cooperative was launched.

## Computer Confidence Training for Grape Growers

Established commercial grape growers have the basic knowledge required to manage a vineyard operation but tend to be less computer literate than those just entering the business. Grape processors in New York and Pennsylvania are moving toward the use of electronic information transfer, via the Internet or e-mail, for communication with growers regarding record keeping and scheduling of harvest. The Finger Lakes and Lake Erie regional grape extension programs of Cornell Cooperative Extension currently have two weekly electronic newsletters available for distribution to growers e-mail accounts. The NYS Integreated Pest Management Program, with funding from the NYS Wine & Grape Foundation has an electronic spray record-keeping system under development that all major grape processors have indicated they would like to implement in one form or another. The number of web-based resources available to growers puts those growers without the skills to use e-mail and the World Wide Web at a distinct disadvantage.

The purpose of the project was to provide grape growers with basic computer skills necessary to comply with new standards being implemented by grape processors, and to assist the growers in developing more advanced tools that will be required of them in an increasingly global industry where access to information can be the key to remaining profitable. To reach these goals, instructors from Jamestown Community College and Finger Lakes Community College conducted 200 hours of classroom and hands-on computer training for 358 grape growers in the Lake Erie and Finger Lakes regions. They taught classes in Windows Foundation, File Management, E-Mail and related topics (calendars, to-do lists, etc.), World Wide Web/Internet Skills, spreadsheets, word processing, record-keeping and bookkeeping. Classes were designed to allow participation by as many growers as possible while providing the amount of individual attention needed for beginning computer users. Class size was small, with 6 to 12 growers at a time. Participants enjoyed the fact that they were taking classes with their peers. The information presented had a grape related theme when possible.

Course participants completed evaluations at the end of each course. One of the major goals of this project was to provide basic computer training to grape growers. We hit this target audience as a majority of the 358 course participants rated themselves as beginner (68%) or intermediate (28%) computer users. Ninety-eight percent of participants felt the training met the course objectives while 86 percent either strongly agreed (37%) or agreed (49%) with the statement 'I feel more prepared to meet the new computer standards being set by the processors. Only one percent of participants felt

that they were not better prepared after taking the course. Many of the participants in the project have expressed an interest in being able to take more advanced computer training. Nearly all (98%) participants feel they are more prepared to meet the new computer standards being set by grape processors in New York State.

## Wide Swath Haylage

Forage is the foundation of dairy profitability. Increasing utilization of farm-produced forage increases animal health, farm profitability, and decreases the excess importation of nutrients - especially phosphorous. For haycrop silage, significant forage quality and quantity (2- 30% of dry matter) is lost between cutting and fermentation by plant respiration. This decreases the most digestible components of the forage. Forage utilization (quality) is also reduced by weather induced delays as the number of good drying days back to back is significantly less than a single drying day.

If instead of mowing to a narrow windrow, the farmer puts it in a wide swath (like dry hay), drying time is reduced from 2 -3 days down to less than one day. This allows harvest to continue with only one day of good weather as opposed to the normal two or three and reduces respiration losses. As this system flies in the face of 30+ years of tradition, in the field research was needed to demonstrate to the farmers the practicality of the system. Extension secured the funding necessary for this research and worked with cooperating farmers for in-the-field trials. This information was communicated directly to the farmers and through multipliers such as dairy nutritionists.

Dairy nutritionists and consultants report that in spite of higher than normal rainfall, participating farmers adopting the wide swath approach were able to secure their forage supply with higher quality parameters. Replicated forage samples showed an increase of 300 lbs. more potential milk/ton of dry matter harvested. Each test was able to secure the forage in one day while the traditional narrow swath required two days for harvest. Nutritionists report that farmers who have tried the system at their recommendation, found it gave the same results that our research produced – haycrop silage was secured in storage in one day rather then the traditional 2 - 3 days, and, the amount of potential milk able to be produced by each ton of dry matter was increased by 300 lbs.

## Transfer of Development Rights

Significant pressure was applied to town governing boards by developers interested in building single-family housing developments in the Town of Lysander (Onondaga County, Syracuse area) and by local residents concerned about the future of the town. Local farmers became concerned about the loss of farmland in the area. Other town residents expressed concern about excessive traffic and road safety, loss of local farmland and loss of viewsheds in the area. Town officials, local residents, farmers, and planning consultants were interested in an alternative means to meet the goals of all involved.

A Municipal Reference for Agricultural Land Use in Onondaga County (with a section on transfer of development rights) was published by Cornell Cooperative Extension of Onondaga County. The reference book was distributed as part of a presentation about agricultural land use issues made before the town board with members of the planning and zoning boards and planning consultants attending. At the recommendation of the Syracuse-Onondaga Co. Planning Agency, information

about property rights and the transfer of development rights from sending areas (farmland) to receiving areas (residential areas) was provided by Cornell Cooperative Extension to local farm property owners, town officials, county planners, and planning consultants. Articles published in a daily newspaper (circulation 121,000) raised awareness of the importance of farmland and land use within local communities.

The Town of Lysander placed a building moratorium on future single-family residential construction until they could re-evaluate their position on future development in the town. The town comprehensive plan was re-examined to allow for the concept of transfer of development rights (TDR) to be incorporated into their local land use plan. Zoning regulations are being assessed to make sure they incorporate the concept of TDR. Town officials and planning consultants held meetings and private conversations to explain TDR concepts to local farm property owners, potential developers, and local town residents. Town officials then designated funding for a TDR concept plan that prioritized 1,581 acres of farmland as sending areas and 1,885 acres of land as receiving areas. The Town then created an innovative revolving fund concept to purchase and transfer development rights from farmland to other land designated as residential to allow appropriate residential development while protecting prime farmland and open space.

## GOAL 2 – A SAFE AND SECURE FOOD AND FIBER SYSTEM

To provide a safe and secure food supply our research program currently maintains three broad initiatives: food safety research program, food quality and functionality program and value-added enhancement program. The three programs combine to address the issues of a safe and secure food system.

We improve the safety and nutritional quality of foods to promote wellness and reduce the risk of disease. We identify and study important consumer and processor food safety issues in the areas of microbiological safety, chemical safety and naturally occurring plant toxicants as well as health promoting opportunities from food components.

Our food safety research program includes initiatives to study the agents, environments and controls related to microbial contamination of fresh and processed foods. Expand research on foodborne pathogens, both emerging and long- recognized species. Develop and utilize modern immunological and molecular biological techniques to study the effect of innovative processes and products on microbial growth and survival and to detect microbial contaminants at very low levels.

This program conducts studies to help processors develop HACCP programs. It includes developing computer simulation/modeling systems to improve food quality and safety and models of microbial growth inhibition. Our scientists investigate putative natural toxicants or antinutrients in genetically modified plant and animal foods. We study the chemistry and toxicology of production-enhancement chemicals used in plant and animal production and manifesting themselves as residue or chemical changes in foods. We investigate health-promoting phytochemicals. This program establishes both required and toxic concentrations of consumption. We investigate risks/benefits associated with increased consumption of plant-based foods. In this program we investigate factors that influence bioavailability of nutrients in foods and diets. We study the effects of processing, preservation and storage on nutritional value and quality of foods. We develop improved chemical and instrumental methods for measurement of macro and micronutrients in foods that can be used for analysis in support of nutrition labeling or for process control. We utilize this knowledge to provide direct assistance to companies to insure the processing of safe foods.

Our program on value added processing systems improves technologies and systems that enhance food value including nutritional value, safety and cost thus securing our food system for the future.

In this effort we evaluate new plant and animal foods and food components as well as production management techniques that add nutritional value and economic benefit. We develop new methods for quality assessment and help set goals for plant and animal breeding and selection. We explore process technologies (e.g., fermentation, thermal processing, extraction, concentration, separation, sensor development) and new modeling techniques that can improve the profitability of the food industry. We study methods of minimal processing and packaging of foods. We also study the economic potential of new products and processes. Our scientists develop engineering systems based on microbiology, enzymology and mechanical techniques to minimize waste disposal problems of the industry. This program develops processing methods for fractionating major and minor components of foods. A major effort includes the development and/or evaluation of processes and/or ingredients designed to improve the sensory quality of low fat foods. We seek to generate the

knowledge base to provide leadership in value-added processing for the food manufacturing industry.

Our program on food quality and functionality uses a multidisciplinary effort as we seek to improve the understanding of mechanisms affecting food acceptability and probe the molecular basis of functionality and quality with special emphasis in the areas of biochemistry of plant and animal foods/post harvest physiology, sensory quality of foods, physical/chemical properties of foods and ingredients and microbiology of foods. Quality foods are a key component to ensuring the security of our food system.

In this program on food quality we develop methods to define and improve quality in fresh and processed foods by studying the factors that influence composition, appearance, flavor and texture with a focus on post harvest storage management and enhancement. We study the biochemistry and genetics of plant and animal products that determine appearance, flavor, and texture. We study the microbial population of foods, and their relationship to quality and shelf life. In order to understand food quality we investigate physical and chemical properties of fresh, raw, and processed foods and ingredients. The development of mathematical models of the relationships between product properties, instrumental measurements and human perceptions are key efforts in this program. Industry directly utilizes this research through outreach and advisory programs.

As effective as these initiatives are, numerous issues will combine to affect changes in their direction over the next five years. The emergence of new pathogens is increasing and will demand greater attention by our scientists. Clearly an interrelationship of both water and food safety issues in our food supply will drive an integration of these research areas. Also the need for unique functional ingredients for food manufacture and health will drive research programs in this area. The need for advanced systems to ensure freshness, quality and safety in fresh and minimally processed foods will require highly interdisciplinary teams of scientists.

## PERFORMANCE GOALS FOR INITIATIVES RELATED TO GOAL 2

Improves the health, nutrition, and safety of communities and individuals

- Prepare and keep foods safely
- Reduce food insecurity
- Increase citizen participation in local food related policy decisions
- Expand knowledge of health behaviors that effect women’s health status
- Increase fruit and vegetable consumption

**Indicator Data Specific to Goal 2**

(For each indicator, both actual and annual target results are included, the latter in parentheses.)

**INDICATOR 2.1** The total number of refereed or peer reviewed articles or materials reporting research related to a safe and secure food and fiber system and the number of related patents, licenses, or varieties issued.

| Year | # refereed items | # patents, licenses, varieties |
|---|---|---|
| **2004** | 149 (125) | 0 (5) |

**OBJECTIVE 2.1** To improve food accessibility, affordability, safety, and nutritional value.

**INDICATOR 2.1.2** The total number of persons completing non-formal consumer education programs on food accessibility and food affordability, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually Adopt practices |
|---|---|---|
| **2004** | 38715 (20000) | 27554 (14000) |

**OBJECTIVE 2.2** To increase the effectiveness of constituent and citizen participation on public policy issues affecting food security (i.e., food access, affordability, and recovery).

**INDICATOR 2.2.1** The total number of persons completing non-formal education programs on public policy issues affecting food security (i.e., food access, affordability, and recovery) and the total number of these persons who actually become actively involved on such issues within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually become involved |
|---|---|---|
| **2004** | 2996 (2000) | 1580 (600) |

**OBJECTIVE 2.3** To annually increase consumer awareness, understanding, and information regarding food safety and food borne risks and illnesses.

**INDICATOR 2.3.1** The total number of persons completing non-formal, consumer education programs on food safety and/or food borne risks and illnesses and the total number of these persons who actually adopt one or more recommended food safety behaviors or practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt behaviors |
|---|---|---|
| **2004** | 47417 (30000) | 31592 (17000) |

**Resources Allocated to Goal 2 (FFF and Match)**

**Dollars (x 1000) and FTE or SY**

| | FY2004 Target | FY2004 Actual |
|---|---|---|
| **Extension** | 2,360 | 2,120 |
| **Total** | (31.5) | (30.9) |
| Research | 790 | 630 |
| Total | (5.2) | (7.6) |

## Impact Examples Related to Goal 2

### Stubborn Persistence of Deadly Food Pathogen Documented

Past Hatch research support was instrumental in development of a Cornell food science faculty member's internationally recognized research program on identifying food pathogens that are of serious public health concern. One identified pathogen, *Listeria monocytogenesin*, can cause listeriosis, a deadly disease that primarily affects pregnant women, newborn children, and adults with weakened immune systems. Each year in the United States about 2,500 people are infected, of which one-fifth die. In 2000, based on this researcher's work that led to the rapid detection of *Listeria* and prevention of a wider outbreak of the pathogen, the researcher was awarded the USDA Award of Superior Service.

In more recent work on *Listeria*, the researcher has found that, despite the efforts of food retailers and food-processing plant managers to maintain a clean, safe environment, strains of *Listeria* can persist for up to a year or longer. The study was designed to help state health departments track the origins of *listeriosis*. Knowledge of the contributions of food contamination with *Listeria* at retail, at restaurants, and at home is extremely limited.

Using samples gathered by state agriculture agency inspectors in New York, the research determined that many food retailers and processes have difficulty in eliminating *Listeria* contamination in their places of business. It found the pathogen in ready-to-eat delicatessen foods like ham, beef bologna, chicken, pastrami, roast beef and smoked fish, and also in hummus, imitation crab, cheeses and in foods requiring cooking before consumption, such as hot dogs and raw foods including beef, ground chuck, turkey, lobster tails and shrimp. The bacterium was found directly on food in 47 of 50 retail food stores, including 20 food stores where the bacterium was found on several foods. When the 50 stores were re-inspected weeks, months or even a year later, about 34 percent had persistence of the same strains of *Listeria*. Of the seven food-processing plants where *Listeria* was found, three had persistent strains of the bacterium.

The study suggested that food retailers might have a harder time controlling for *Listeria* than do food processors due to additional, uncontrollable vectors of contamination. Food processors can control for people entering the plant, while retailers cannot always control the pathogens introduced by customers and employees. The study underscored the hardiness of *Listeria,* suggesting that even the best attempts to clean and rid a business of the pathogen can fail.

In his relatively young career at Cornell, the researcher has used competitively-awarded Hatch funds to leverage funding from other external agency for his work on *Listeria.* Such subsequent sponsors have included the NIH, private industry (e.g., Kraft Foods), and not-for-profit organizations (e.g., the International Life Science Institute). Total Hatch grant support of less than $170K to date has directly leveraged over $5M in total external sponsorship of this faculty member's food safety-related research program--a return-on-investment ratio of 30 to 1. The recent work noted above was supported by funds from USDA and NIH, and was published in the *Journal of Food Protection* (July 2004).

## New Test for Determination of Nut Contamination in Foods

Peanuts allergy is a serious health problem in the United States because of its low outgrowth and life-threatening characteristics. A national survey has indicated that 1.2% of all Americans, or about 3 million people, are allergic to peanuts, tree nuts, or both. Each year in the U.S., thousands of people are sent to hospital emergency rooms after accidentally or inadvertently eating peanuts (or their processed by-products or residues), and about 50 to 100 die. Moreover, the prevalence of peanut allergy in America appears to have increased over the last 20 years.

Currently, no immunotherapy has been successfully developed to treat peanut allergy. The only effective way to prevent adverse allergic reactions to peanuts is to maintain strict avoidance of peanuts and the peanut allergen. Typically, accidental exposures to peanut allergens are due to the contamination by peanuts in production lines, or the presence of undeclared (unlabeled) allergens in food products. As such, the development of a portable, rapid, accurate, reliable and sensitive assay test to detect hidden peanut allergens is needed.

A food science and technology researcher at Cornell developed an immunoassay for rapid detection of the major peanut allergen in chocolate. It also has application for use with other types of contaminated foods. A Canadian company, by agreement with a New York State firm that has licensed the technology from the Cornell Research Foundation, is funding developmental work to commercialize the immunoassay's approach and application for allergenic substances in foods.

## Food Safety Training for Vocational Education Culinary Arts Program

As the number of meals consumed outside the home increases, so too does the need for experienced, well-trained employees to work in food service operations. Unfortunately, a high turnover rate within the industry results in many foodservice operators hastily hiring young, inexperienced applicants to fill low paying - but essential - positions within their operations. Often, these new employees are provided with little to no formalized training prior to employment. Instead, the employees tend to "learn-as-they-go" while on the job, often receiving cursory training under intense, sometimes stressful work conditions. Under this scenario, employees are likely to learn and adopt inappropriate short cuts in their food production practices that could compromise the quality and safety of the food they serve. Nearly every case of food-borne illness can be traced to human error at some point in the food flow. Although generally easily preventable with proper training, food borne illness outbreaks too often occur because an untrained or unmotivated employee was allowed to prepare food in an improper manner. Compromised food safety practices often lead to food borne illness among customers, which in turn proves costly to the foodservice industry in terms of loss of business, negative publicity, closed restaurants, costly lawsuits, and in some cases, death. Ideally, comprehensive food safety training is administered prior to employment in the industry because it ensures that employees enter the industry with a solid background in foodservice sanitation and knowledge of practices that compromise the safety of the foods served within their respective establishments.

Cornell Cooperative Extension of Onondaga County implemented and evaluated a comprehensive foodservice sanitation-training program for students enrolled in a Culinary Arts Course conducted by a regional Board of Cooperative Educational Services (BOCES) in Syracuse, New York. BOCES

serves vocational students including developmentally disabled students. Initially, the target audience consisted of forty to fifty 11th and 12th grade students enrolled in the High School BOCES Culinary Arts I program. However, during the planning phase of the project, the instructor for an adult education culinary arts course at another regional BOCES Training site inquired about a food safety-training component for her program at the Liverpool, N.Y. OCM BOCES Training Center. In cooperation with the Culinary Arts Instructors and a Science Teacher at the High School BOCES, the proposed food safety and sanitation training was integrated into both programs. Overall, thirty-two high school and fifteen adult BOCES students participated in the Sanitation Training Program during the fall semester. Six classes were conducted for the high school students and four 2.5-hour classes were conducted for the adult students. The course book, videos and training format were created and provided by the Educational Foundation of the National Restaurant Association (EFNRA). The course was conducted as a non-certification, introductory training for those with limited or no foodservice experience.

The Food Safety Training component that was integrated into existing BOCES curricula strengthened two highly-successful Culinary Arts Programs, while enhancing learning through program delivery modalities suited to the developmental needs of the targeted audiences. As a result, each student who pursues a career in food service will enter the field with practical knowledge of safe food-preparation practices.

Specifically, each of the thirty-two high school and fifteen adult education students successfully completed the training and were provided with certificates of participation. Five high-school students who did not achieve a passing score on the post-test and were retested, with each successfully passing the retest. The students completed the training program with demonstrated competencies as indicated through knowledge and skill assessments conducted at the conclusion of the training. The culinary arts instructors from both high school and adult BOCES education centers have integrated comprehensive food safety/sanitation training into their culinary courses.

## Food Stamp Nutrition Education Intervention/ Eat Smart New York Food Safety Reduces Health Risks

Reducing the spread of bacteria in the kitchen including proper hand washing techniques are important food safety practices that help prevent food-borne illness. Food-borne illness affects 76 million people each year, causing them to become ill and, in extreme cases, die. People who are most at risk for food borne illness are pregnant women, older persons, people with weakened immune systems or certain chronic illnesses, and young children.

The Eat Smart New York (ESNY) program of Cornell Cooperative Extension of Nassau County provides a series of hands-on classes in food, nutrition and health to food stamp recipients. The adult participants learned the importance of food safety and practiced the techniques and skills of keeping food, working surfaces, utensils and their hands clean. Through partnerships with 22 community organizations, 326 persons completed the lesson series. Dietary recall and behavior checklist survey questions, completed by the participants at entry and exit of the program, indicated that 88% made at least one improvement in safe food handling. Nearly all (97%) participants demonstrated acceptable food safety practices (i.e. thawing and storing foods properly) upon exiting the program as compared with only 32% upon entering the program.

**Safety of Eating Contaminated Sport Fish**

Early in her career at Cornell, a faculty member in Natural Resources received modest Hatch grant support ($31,000 over 2 years) to conduct a situational analysis on Lake Ontario fisheries management issues. Identified in this research was the emerging and vexing issue of contaminants in sport fish--fish that could and would be eaten by anglers, their families and friends. A second Hatch grant ($18,000 over 5 years) was used to examine how general risk communication theory might be applied to fishery management issues on the Great lakes and also across the nation.

Subsequent external funding in this area of inquiry has to date attracted over $650K in support from the Great Lakes Protection Fund, the New York Sea Grant Institute, the New England Interstate Water Pollution Control Commission, and most significantly the U.S. Environmental Protection Agency. Results from these research projects have assisted consumers in deciding how much sport-caught fish they should eat, taking into account the benefits and risks of eating such fish. Sub-populations of concern--pregnant women, women of child-bearing age, children, and those whose consumption of self-harvested fish is economically or culturally dictated--have been particular benefactors of this research.

A document developed as a result of this research under EPA sponsorship is used as primary guidance for U.S. states and Native American nations regarding communicating advisories to the public about fish contaminant risks. The faculty member is currently involved with an EPA-initiated revision and updating of the document.

**GOAL 3 – A HEALTHY, WELL-NOURISHED POPULATION**

Improving the health of our population through food/nutrient-based strategies will become increasingly important in the next five years in achieving health goals designed to reduce preventable mortality and morbidity in the United States. These strategies will be of special significance to USDA because they will serve as important bridges between the country's food production and health sectors. These strategies will be particularly valuable to approaches that seek to empower individual consumers in taking increased responsibility for their health, assure that our food system is consistent with health goals, and refashion our health system, particularly approaches most concerned with cost containment through prevention of chronic, debilitating diseases.

Research areas of current interest include (1) the study of glucose, lipids, vitamin E and homocysteine in cardiovascular disease, obesity, and/or diabetes, (2) role of various nutrients in fetal neural and cognitive development (e.g. genetic polymorphisms and folic acid metabolism), retinoic acid and gene transcription, (3) nutrition and cancer (e.g. modes of action of selenium and vitamin E, role of predominant plant based diets, and the physiochemical properties of dietary fiber), (4) the role of nutrition in the regulation of inflammation (e.g. effects of dietary fat on the expression of genes during the inflammatory response), (5) maternal nutrition during pregnancy and lactation, (6) postpartum weight retention, (7) fetal metabolic imprinting and its relationship to chronic disease, (8) neurohormonal and psychological influences on eating behavior, (9) food security, (10) domestic and international food and nutrition policy, (11) iron and other micronutrient deficiencies, (12) nutritional impact of parasitic infections, (13) behavioral determinants of food choices, (14) dietary assessments among ethnic minorities, and (15) social patterns of obesity and weight control.

The most recent dietary guidelines reemphasize the increased reliance on plant-based foods as a means of controlling caloric consumption, reducing fat intake, modifying the composition of ingested fats, enhancing the consumption of foods associated with reduced cancer risk, and simultaneously insuring that macro- and micronutrient needs are met. For the first time the dietary guidelines also provide information to consumers who restrict their consumption of animal foods completely or rely on only selected few to meet their dietary needs. Future research activities must explicitly recognize the health goals, policy aims, and consumer practices that support these guidelines.

Thus, future research investments will be made in activities that (1) explore how complex genetic interactions determine developmental and other physiological pathways (and thus specific phenotypes) under diverse nutritional conditions (The impending description of the human genome make this an especially exciting opportunity.), (2) capitalize on an improved understanding of the determinants of human behavior to design effective interventions for behavior change related to nutrition, (3) analyze outcomes of food policy options related to food security, health, and disease prevention, and (4) enhance international collaborations that recognize the globalization of the US food supply.

## PERFORMANCE GOALS FOR INITIATIVES RELATED TO GOAL 3

Improves the health, nutrition, and safety of communities and individuals.

- Increase citizen participation in local health and safety policy decisions
- Expand knowledge of health behaviors that effect women's health status
- Increase fruit and vegetable consumption

### Indicator Data Specific to Goal 3

(For each indicator, both actual and annual target results are included, the latter in parentheses.)

**INDICATOR 3.1** The total number of refereed or peer reviewed articles or materials reporting research on human nutrition and health or health promotion and the number of related patents, licenses, or varieties issued.

| Year | # refereed items | # patents, licenses, varieties |
|---|---|---|
| **2004** | 187 (300) | 6 (2) |

**OBJECTIVE 3.1** To achieve a healthier, more well-nourished population.

**INDICATOR 3.1.2** The total number of persons completing non-formal nutrition education programs on better management of health risk factors (e.g., obesity, hypertension, etc.) and the total number of these persons who actually adopt one or more recommended nutrition practices to reduce health risks within six months of completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually Adopt practices |
|---|---|---|
| **2004** | 42098 (35000) | 28637 (16500) |

**OBJECTIVE 3.2** To annually increase consumer awareness, understanding, and information on dietary guidance and appropriate nutrition practices.

**INDICATOR 3.2.1** The total number of persons completing non-formal nutrition education programs that provide dietary guidance to consumers and the total number of these persons who actually adopt one or more recommended Dietary Guidelines within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt recommendations |
|---|---|---|
| **2004** | 65542 (38000) | 39764 (19000) |

**OBJECTIVE 3.3** To promote health, safety, and access to quality health care.

**INDICATOR 3.3.1** The total number of persons completing non-formal education programs on health promotion and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt practices |
|---|---|---|
| **2004** | 47388 (20030) | 32907 (12003) |

**OBJECTIVE 3.4** To annually increase the level of individual and family safety (or reduce risk levels) from accidents in the homes, schools, workplaces, and communities.

**INDICATOR 3.4.1** The total number of persons completing non-formal education programs on home and workplace safety and risk reduction and the number who actually adopt one or more recommended practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt practices |
|---|---|---|
| **2004** | 14551 (4500) | 12101 (2003) |

**OBJECTIVE 3.5** To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting health community decision-making.

**INDICATOR 3.5.1** The total number of persons completing non-formal education programs on public policy issues affecting health community decision-making and the total number of these persons who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually become involved |
|---|---|---|
| **2004** | 1093 (2500) | 813 (500) |

**Resources Allocated to Goal 3 (FFF and Match)**

**Dollars x 1000 and (FTE) or (SY)**

| | FY2004 Target | FY2004 Actual |
|---|---|---|
| **Extension** | 3,758 | 3,456 |
| **Total** | (50.2) | (49.3) |
| **Research** | 1,295 | 445 |
| **Total** | (8.0) | (1.2) |

## Impact Examples Related to Goal 3

### Disease-fighting Chemicals in Apples Could Reduce the Risk of Breast Cancer

An apple a day can help keep breast cancer away, according to an animal study conducted by food scientists at Cornell University. In a study partially supported by Hatch dollars and considered to be first-ever investigation of the effects of apples on animal cancer, researchers treated a group of rats with a known mammary carcinogen and then fed them either whole apple extracts or control extracts. They found that the number of tumors was reduced by 25, 25 and 61 percent in rats fed, respectively, the equivalent of one, three or six apples a day, while tumor incidence was reduced by 17, 39 and 44 percent in rats fed the human equivalent of one, three or six apples a day, respectively, over 24 weeks.

The report on this study will be published in a spring 2005 issue of the *Journal of Agricultural and Food Chemistry*. In an article in the journal *Nature* five years ago, the researchers credited phytochemicals -- antioxidants -- in fresh apples with inhibiting human liver and colon cancer cell growth. Antioxidants help prevent cancer by mopping up cell-damaging free radicals and inhibiting the production of reactive substances that could damage normal cells. Studies by these researchers and others increasingly provide evidence that the additive and synergistic effects of the phytochemicals present in fruits and vegetables are responsible for their potent antioxidant and anticancer activities.

Findings from these studies give support and credence to federal government promotional campaigns to increase the proportion of fruits and vegetables in the American diet as a means to realize public health benefits, and also suggest that the balanced array of complex chemical components found in fruits and vegetables are superior to those obtained from dietary supplements. As such, the researcher's studies support the concept of "food synergy," currently gaining strength in the food science research community. It emphasizes the importance of the synergistic combination of substances in whole foods --rather than large doses of selected food compounds-- in improving human nutrition and long-term health.

### Multistate Research Documents Rural Family Nutritional Issues

Understanding how rural low-income and poor households deal with limited economic resources and manage to maintain the nutrition of household members is critical to formulating and implementing rural economic, community development, and public health policies across the United States that support the goal of "food security" for American families. A multistate research project called "Rural Families Speak" and involving nutritionists from Cornell, Purdue, Ohio State University, and Louisiana State Universities was designed to explore, through household interviews, how rural households are coping with the challenges to maintaining family nutrition.

Results from part of the group's work was published in a 2004 issue of *Family Economics and Nutrition Review*. Three-hundred sixteen (316) low income families in 24 rural counties in 14 states were interviewed. These interviews found that about half of the rural low-income families were "food insecure," that is, having limited or uncertain availability of nutritionally adequate and safe

food. After controlling the data for income and other financial resources, further analyses determined that one of the most significant factors in predicting food insecurity in these families was how many food and financial skills the mother employed. The more skills the mother held and applied, such as bill management, budget development and adherence, food or menu "stretching," and meal preparation, the less likely she was to have a food-insecure household. The study also implicated the mental and physical health status of the mother as an important factor in overcoming food insecurity in rural low-income families.

The study is considered to be the first to show how important food and financial skills and the health of the mother are to predicting whether a family is food secure or not. It also found that while about three quarters of the families in the study had a high level of food and financial skills, about 40 percent of those with such higher skills were still food insecure, while 80 percent of those with lesser skills were food insecure. The study suggested that education in "life skills," such as those taught by cooperative extension programs and the federally supported Expanded Food and Nutrition Education Program, may be important ways to promote food security and better public nutrition.

## Parent-Child Communication a Key to Youth Health

Decades of research in youth development have clearly shown that while the young enjoy and value their friends, it is relationships with caring adults that provides the foundation for their maturation. One topic that studies from around the globe have found to be especially important to the inquiring minds of youth is HIV/AIDS. Yet, getting parents and kids to talk plainly and accurately about this dreaded disease is a challenge.

A Hatch-supported research project was designed to better understand the means and barriers to straightforward communication between adults and youth on health-related topics. Called Project Rural Road, the study asked rural teenagers to list the three very significant adults in their lives, and then to describe whether that had had any conversations with those adults regarding a variety of health topics. Alcohol was cited as the most frequent topic in health-related conversations between teens and adults, while sexually transmitted disease was the least.

Amid this silence, the HIV virus has come to infect one percent of the world's population, with some 3 million people dieing of AIDS in 2003, while another 5 million (half of them under the age of 25) being infected. New York State has more HIV/AID cases than any other single state in the nation, with more than two-thirds of the diagnosed cases being in members of the parenting generation (ages 30-49). Rural Roads Project researchers believe that this may be one reason why such adults are reluctant to discuss the virus with teenagers, i.e., the parents' emotional burden of perhaps having peers with the disease or who have died, and being protective of their offspring may complicate open and frank discussion.

Data from the pilot portion of the study also suggests that impact and fear of the disease is widespread, even in rural areas where diagnosed cases are low. More than two-thirds of teens interviewed reported that they were worried that someone they know would contract HIV/AID, with one-third worrying that they themselves might get the disease.

Project Rural Roads funding has been extended to 2007 which will allow further probing into teen-adult communication aspects that may affect and hopefully work to improve youth health.

## Family Life Program

Families and individuals with limited means, because of insufficient resources and inadequate nutrition knowledge, make unwise dietary decisions leaving them vulnerable to nutrition and health related problems. They may also lack basic food management skills and strategies to cover family food needs. According to 2000 Census data, 9.2% (about 3,600 people) of the population and 12.4% (about1200 people) of the children in Wyoming County were living below the poverty level. In October of 2004, there were 957 food stamp cases in the county. According to the Hunger in America report, 12.2% of Wyoming County's population is elderly and 18.5% of seniors in New York State are at risk for poor nutritional health. That would be almost 1000 elderly.

The Cornell Cooperative Extension of Wyoming County Family Life Program meets with individuals of limited means one-on-one and in groups. Four community educators build skills in shopping, nutrition, food safety, food resource management, and parenting around feeding through individualized and group instruction. In the October 1, 2003 through September 30, 2004 program year, the Family Life Program staff reached 261 adults with 668 family members in a series of planned lesson. In addition, 5796 residents were reached with educational programs at health fairs and community events, senior feeding sites, food pantries, the farmers' market, Wyoming County Fair, and community groups. Family Life program staff also increased the skills of 131 4-H age youth. A collaboration with county preschools resulted in interactive, fun lessons for 339 children and a parent letter with ideas for reinforcing the lessons.

The results of pre- and post-tests show that participants increased knowledge and skills and changed practice as follows: 79% improved at least one nutrition practices, 63% improved at least one resource management practice, 35% improved at least one food safety practice. For example, 42% more often used the "Nutrition Facts" label, 35% more often planned meals in advance, 25% more often use a list for grocery shopping, 18% more often compare prices when shopping, 21% more often prepared foods without added salt, and 31% do not thaw food at room temperature. Of those whose 24-hour food recalls were analyzed, 91% made a positive change in at least one food group from pre-test to post-test.

There also were numerous individual benefits from the program. One participant with high energy bills and a refrigerator that did not work was able to obtain a new, efficient refrigerator through the Power Partners program. One mentally challenged woman was making poor food choices because she had limited nutrition knowledge and food preparation skills. By offering hands-on, one-on-one lessons, the participant was able to learn to cook for herself and make better food and portion choices. An elderly woman in the habit of leaving food to thaw on the counter modified her practices based on her experience with the program. A single mom wanted to continue to breastfeed as long as she could, but needed support. Through the In-Home Breastfeeding Support Program, the mom learned more about the value of breastfeeding. In spite of many personal and physical problems that the participant had, with the CEs support, she breastfed her baby for 13 months.

## Planning For Healthy Babies - Folic Acid Education

Each year approximately 2,500 babies in the United States are born with birth defects of the brain and spinal cord called neural tube defects. Folic acid, a B vitamin, has been proven to prevent these neural tube defects. It is believed that up to 70% of neural tube defects may be prevented if women consume 100% Daily Value of folic acid every day prior to conception and during the first month of pregnancy. Most women are not aware of the role folic acid plays in preventing neural tube defects and they do not realize that they need to consume an adequate amount of folic acid prior to conception to help prevent neural tube defects.

Cornell Cooperative Extension of Nassau County received a community grant from the March of Dimes to educate women of childbearing age about the importance of adequate folic acid in preventing neural tube defects and how they can easily get the recommended daily amount of folic acid. Low-income women of childbearing age were given multivitamins with 100% Daily Value of folic acid to help them meet the daily recommendation. Nearly 950 women of childbearing age were taught the importance of consuming a sufficient daily amount of folic acid to help prevent neural tube defects at 74 community workshops. Seventy-nine staff members who work with women of childbearing age were educated about the important need for women of childbearing age to consume a sufficient daily amount of folic acid to help prevent neural tube defects at 7 staff training sessions. Over 600 women learned about the importance of folic acid in preventing neural tube defects through informal meetings and sessions conducted by Cornell Cooperative Extension staff and by the 79 staff members that attended a staff training session. 300 low-income women of childbearing age were given multivitamins with 100% Daily Value of folic acid to help them meet the daily recommendation.

Three quarters (75%) of the women completing a follow-up survey reported that they are taking a multivitamin that contains 100% Daily Value of folic acid every day and that they plan on taking folic acid supplements daily throughout their childbearing years. 81% of the women that completed a follow-up survey reported that they have shared this important information with at least one other woman of childbearing age. Over 50,000 additional Nassau County residents learned about the important need for women of childbearing age to consume a sufficient amount of folic acid to help prevent neural tube defects through press releases and articles written for Cornell Cooperative Extension of Nassau County newsletters.

## Eat Smart New York

In Yates County, more than 3,000 residents currently live below the federal poverty level, and more than 1,100 receive food stamps. The mission of the Eat Smart NY program is to increase food security and reduce hunger by providing nutrition education to food stamp recipients and applicants. Lessons focus on improving dietary quality, food security, food resource management, and food safety.

Faced with poverty, limited resources, and food insecurity, people often make poor food choices, which lead to chronic health problems such as obesity, diabetes, high blood pressure, and heart disease. Low-income Yates County residents are more than twice as likely to die of heart disease as demographicically similar individuals with higher incomes. Many lack basic food preparation and

menu planning skills, necessary for success in stretching food dollars and providing nutritious meals.

In 2004, the ESNY nutrition educator reached 122 families with on-going, in-depth, nutrition lessons, including one-on-one and group instruction. Informal, hands-on lessons with food preparation practice, demonstrations, and activities are offered. An additional 254 people were provided with unstructured nutrition education at community locations such as food pantries, health fairs, or one-time meetings.

346 youth in 22 groups were reached through ESNY in 2004. A series of lessons with a focus on healthy lifestyle choices was presented during the summer to youth throughout the county. Participants learned about balancing food intake and energy output through good nutrition and physical activity. A bi-monthly newsletter is distributed to families with nutrition information, program updates, and low-cost recipes. Program information was shared with other local agencies through interagency meetings and news articles.

77% of adult participants showed improvement in one or more food resource management practices (plans meals, compares prices, does not run out of food, or uses grocery lists). 87% improved in nutrition practices (plans meals, makes healthy food choices, prepares foods without adding salt, reads nutrition labels, or has children eat breakfast). 52% improved in food safety practices.

Of youth targeted, 98% now eat a variety of foods. Participants increased knowledge of the essentials of human nutrition, increased their ability to select low-cost, nutritious foods, improved practices in food preparation and safety, and learned the relationship among eating practices, fitness and health.

**GOAL 4 – GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT**

Improving the integrity of our environment and maintaining the ecological systems that enable human prosperity will continue to be high priorities of society, and therefore high priorities of its publicly supported research and educational institutions for the next five years. Growing human populations cause growing consumer demands on the agriculture and food system, which magnifies the challenges of balancing agricultural production and food processing with stewardship and protection of the environment.

CUAES has invested heavily in science to avoid and mitigate impacts of agriculture on the environment. We view the long-term sustainability of agriculture as being inexorably linked to environmental quality. As part of our strategy, we are emphasizing a higher level of integration of research and extension to accelerate: identification of problems, focusing scientific effort to resolving problems, field-testing and evaluation of technology and cultural practices, and introduction of environmentally superior innovations/practices to the agricultural community.

The research program is necessarily broad, with complementary thrusts in:

Minimization of chemical inputs--(a) research to improve pest management in plant agriculture, (b) development of viable biological control of pests, (c) improved cultural practices (plant systems management), (d) plant and animal breeding research to improve pest resistance and minimize nutrient inputs, (e) soil-plant systems investigations to improve nutrient management, and (f) technological innovations to reduce pathogens associated with animal agriculture.

Development of agricultural practices that minimize negative impacts on other natural resource values—(a) protect the integrity of water quality, fish and other aquatic resources, wetlands, terrestrial wildlife habitat, forests, and aesthetic considerations; (b) minimize consumption of energy and petroleum-based materials on farm.

Development of environmentally friendly and profitable alternative agricultural products—(a) identify new products and production methods that result in less impact on the environment, (b) develop markets and design marketing strategies that increase profitability of environmentally friendly agricultural products.

Improvement of waste management associated with the agriculture and food system–(a) reduce quantity of on-farm waste, (b) improve management of farm-produced waste, including quality and disposal, (c) reduce quantity of waste in food processing, (d) improve management of waste produced in food processing, including quality and disposal, (e) develop scientific understanding of potential for use of agricultural land for environmentally safe application of municipal sewage sludge.

Future research investments will continue to be made in fundamental and applied science areas leading to improvements in chemical management, nutrient management, waste management, and habitat protection on the farm; energy conservation on farm and in food processing; waste management associated with food processing; and natural resource stewardship.

**Issues, Opportunities and Constraints**

Issues--Accelerated time frame of society's expectations for "cleaning up agriculture" versus reality of pace of science progress, especially given modest funding levels; public image of agriculture and AES system

Opportunities—Keen interest of excellent scientists to address the problems and discover solutions; public support for this kind of work; graduate student interest is high

Constraints—Lack of sufficient federal funding directed at this area so that science can be accelerated (need facilities improvements, fellowships for best grad students, research operating dollars, etc.)—society's desire for improvements in this area are not matched with financial commitments required to do the job at the rate we all would like; AES's can move some FFFs to this need, but many other agricultural production needs exist that make it very difficult to redirect large portions of the FFF research portfolio.

## PERFORMANCE GOALS FOR INITIATIVES RELATED TO GOAL 4

Improves the quality and sustainability of human environments and natural resources.

- Ensure quality and conservation of water supply
- Promote environmental stewardship and sound decision making about the management of natural resources
- Promote community, agricultural, and residential environmental enhancement
- Prepare youth to make considered environmental choices
- Enhance science education through the environments

### Indicator Data Specific to Goal 4

(For each indicator, both actual and annual target results are included, the latter in parentheses.)

**INDICATOR 4.1** The total number of refereed or peer reviewed articles or materials reporting research on agricultural, natural resource, and environmental policies, programs, technologies and practices and the number of related patents, licenses, or varieties issued.

| Year | # refereed items | # patents, licenses, varieties |
|---|---|---|
| **2004** | 386 (255) | 1 (2) |

**OBJECTIVE 4.1** To develop, transfer, and promote adoption of efficient and sustainable agricultural, forestry, and other resource policies, programs, technologies, and practices that protect, sustain, and enhance water, soil and air resources.

**INDICATOR 4.1.2** The total number of persons completing non-formal education programs on sustaining and/or protecting the quantity and quality of surface water and ground water supplies and the total number of these persons who actually adopt one or more water management practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually Adopt practices |
|---|---|---|
| **2004** | 50783 (15000) | 17758 (5000) |

**OBJECTIVE 4.2** To annually increase producer adoption of agricultural production "best practices" that conserve, protect, and/or enhance the soil resources on or adjacent to agricultural production sites or land uses.

**INDICATOR 4.2.1** The total number of persons completing non-formal education programs on conserving, sustaining, and/or protecting soil resources and the total number of these persons who actually adopt one or more soil conservation practices within six months of completing one or more non-formal education programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt practices |
|---|---|---|
| **2004** | 18918 (6500) | 9604 (3250) |

**OBJECTIVE 4.3** To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

**INDICATOR 4.3.1** The total number of persons completing non-formal education programs on public policy issues affecting agricultural production and ecosystem integrity and biodiversity and the total number of these persons who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs.

| Year | Output: # persons completingprograms | Outcome: # who actually become involved |
|---|---|---|
| **2004** | 12193 (30000) | 7925 (2000) |

**Resources Allocated to Goal 4 (FFF and Match)**

**Dollars x 1000 and (FTE) or (SY)**

| | FY2004 Target | FY2004 Actual |
|---|---|---|
| **Extension Total** | 3,184 (50.4) | 2,894 (49.2) |
| **Research Total** | 2,150 (13.6) | 2,335 (21.1) |

## Impact Examples Related to Goal 4

### Understanding the Ecological Dynamics of the Northeast Forestry Resource

Forest managers in the Northeastern U.S. are confronted with a host of ecological and human-induced factors affecting the sustainable quality and production of forestry resources. Exotic species invasions, tree mortalities and declines among certain valuable species, and soil and water acidification are among the many issues that need long-term research study on which to base management decisions.

Over the last 10 years, a Cornell forest ecologist has used modest McIntire-Stennis support to develop and maintain an infrastructure that allows and enhances long-term investigations of forest environment dynamics in the Northeast. This support was pivotal in helping to establish permanent research plots at three sites in New York and New Hampshire, which in turn have been used in externally-sponsored studies conducted as part of NSF's Long-Term Ecological Research (LTER) Project based at Hubbard Brook watershed in New Hampshire.

Observations made at the permanent plots regularly result in hypotheses that are then tested as part of the $4.9M NSF/LTER Project's research program. These studies have addressed aspects of species invasions, tree growth/death patterns, sugar maple declines, and ecosystem carbon balances, all of which have important public forestry resource, global environmental change, and federal air, water, and soil pollution regulation policy implications.

### Cornell Wildlife Researchers Work to Mitigate Damage from Deer

Human and societal damages from uncontrolled deer populations in the U.S. are staggering, with well over 500,000 deer-automobile collisions accounting for over $1B in vehicular damages, 29,000 human injuries, and approximately 200 human fatalities annually. In addition to car collisions, deer browsing on farm crops and on vegetation at residential properties, plant nurseries, and ornamental enterprises is widespread, having adverse economic and aesthetic effects.

Hatch projects led by Cornell researchers have helped communities, agencies, land owners, businesses and growers become more aware of the scope of deer-related damage, and ways to mitigate it. A recent survey conducted by a team of researchers sought to assess the extent of damage within New York State and also the Northeast. On New York farms, deer damage from browsing was estimated at almost $60M annually, with an annual cost to the average grower of $2300. Four regions of the state were particularly prone to crop damage from deer, including the western and southeastern parts of the state, and also the Finger Lakes and Long Island areas. This estimate, combined with car collision damage estimates, indicated that the annual cost of adverse human-deer interactions in New York State exceeded $230 million.

In addition, working with researchers from other Northeast land grant institutions on a multistate project and also with state wildlife agencies, damage in the Northeast region from deer collisions and crop browsing was estimated to exceed $600M annually. These estimates were shared not only with wildlife agencies, but also with members of the state congressional delegation. In one instance, a

member of the House of Representatives from New York sought to include funding for a national deer damage mitigation program as part of the federal transportation bill.

Researchers have also sought to help out on this issue at the local level. One team of research faculty and educators piloted a local citizen involvement process that can be used to guide other communities in making more informed decisions when addressing deer-related problems. A second team has explored the feasibility of using immuno-contraception vaccine approaches to limiting deer reproduction. A third team set about exploring herbivore resistance of natural plant compounds. In this last instance, modest investment of Hatch research funding ($12,000) was used as a base to leverage additional support from the Horticultural Research Institute ($10,000) and USDA-Agricultural Research Service ($176,000), and attract study collaborators (e.g., biochemical analysis was conducted in cooperation with the Boyce Thompson Institute for Plant Research). This work led to several peer-reviewed publications and presentations at industry meetings. Each of these projects has generated data and educational information to help communities in New York and the nation consider their best options for deer-damage control.

## Phosphorous Fertilizer Starter Project

Managing phosphorous has become a major issue for New York State agriculture. Farms typically use phosphorous in their starter fertilizer for crops such as corn, soybeans, small grains, and hay crops. Phosphorous is an essential element to ensure crop growth and development. With a large dairy influence, the need for phosphorous supplements had declined due to manure application. Manure application tends to build up phosphorous levels over time, and in many cases, to the point of leaving the field either as runoff via soil erosion, leaching, and as soluble phosphorous in rain runoff. Recently, the Cornell University Soils Laboratory ran a database scan and saw that over 50% of fields tested were high or very high in phosphorous. With surface water concerns, there was a need to reduce phosphorous use in fields that did not need it. Additionally, Concentrated Animal Feeding Operations (CAFO's) are required to use a phosphorous index in New York, which, in a worst case scenario, could eliminate the use of any phosphorous in the form of fertilizer or manure on fields testing high in P and having a high runoff risk. The real need was to show farmers that equivalent yields could be obtained using minimal or no P in the starter fertilizer, thereby reducing overall P loads on farms.

Cayuga County Extension joined forces with the nutrient management program at Cornell University, headed by Dr. Quirine Ketterings. Dr. Ketterings obtained a Sustainable Agriculture Research and Education (SARE) grant and began a demonstration/research plot study across New York State. Plots were set up by county agricultural educators in several counties, looking at high P fields and comparing no phosphorous to minimal amounts of P to the farm's conventional fertilizer program. The project ran for four years. Each site was used as a plot replication. Cayuga County had nine plots over the four year period. Informational meetings and surveys were designed around the plots. Many articles were written in newsletters. In Cayuga County and the rest of the state, the research showed that there were no yield gains by adding phosphorous to a starter for corn in high P fields. This clearly showed that farmers could reduce P inputs on their farms, saving them money and reducing environmental impacts.

Our efforts to communiate demonstration plot findings have resulted in a 15% overall drop in phosphorous usage over the past 3 years according to a survey of Cayuga County growers. This drop results in an average of $3.75 savings per acre. Over 400 acres of corn, this translates to a $1400 savings. In terms of community benefit, this savings becomes $2450 in community benefits, using a $1.75 conversion factor, as this money is typically reinvested within the community. The 15% drop comes from either overall fertilizer reductions, or not applying phosphorous to sensitive fields. In either case, this results in significantly less P entering our local watersheds. Even greater reductions, 30% or more, are expected on livestock operations.

## Preventing and Responding to Invasive Aquatic Plant Infestations

Invasive aquatic plants wreak ecological and economic havoc on waterbodies in the Oswego River Basin. They negatively impact fisheries, native aquatic species, recreation and waterfront property values. In the US, $100 million dollars is invested annually in non-indigenous aquatic weed control with millions more in recreational losses. The most cost-efficient and environmentally friendly strategy combines prevention, early detection and rapid response. Portions of the Oswego River Basin are already infested with water chestnut while many areas are not. The whole basin is vulnerable to a host of other invasive aquatic plants in addition to water chestnut.

Cornell Cooperative Extension has been working collaboratively within Onondaga County government and regionally to enlist and educate volunteers in the prevention, early detection and appropriate control of water chestnut. Cornell researchers have been studying control methods on Oneida Lake at Cornell's Shakelton Point Biological Research Station. A summer intern worked closely with these researchers to map the problem and identify areas suitable for removal by volunteers. Workshops were held on control and prevention techniques to manage water chestnut and train volunteers in hand-pulling control techniques and mapping using Global Positioning Systems (GPS). We organized hand-pulling days and developed an adopt-a-shoreline program on Oneida Lake.

Twenty-two Weed Watch Out! (W20!) volunteers were trained including people from Owasco Lake, Skaneateles Lake, Oneida Lake, Onondaga Lake and the 3 River System. One third of the shoreline of Oneida Lake has been adopted by volunteers who monitor for water chestnut. Volunteers from the Oneida Shores Rotary Club removed most of the water chestnut not killed by a chemical treatment on the Western end of Oneida Lake. Volunteers on Onondaga Lake and Oneida Lake reported previously unknown populations in outlets or inlets to the lakes. About a dozen members of the Onondaga Yacht Club worked on two separate days to remove populations of water chestnut in the outlet of Onondaga Lake.

## Precision Feed Management Program

Delaware County is home to two of the reservoirs supplying drinking water to the 9 million residents of New York City, including the Cannonsville reservoir, the third largest reservoir in this, the largest unfiltered surface water supplied system in the world. The Cannonsville reservoir is eutrophic due to high levels of phosphorus, which in turn increases the need for chlorination of water from this reservoir to make it potable. Chlorination, in turn, increases the risk of carcinogenic chlorination

by-products. Agriculture, particularly dairy farming, has been identified as the largest source of phosphorus entering the Cannonsville Reservoir. The largest source of phosphorus entering dairy farms is purchased feeds. Despite this, agriculture is a preferred land use in the New York City Watershed and is the largest industry in Delaware County. Economic conditions however have made it difficult for dairy farmers, especially small farms, to remain viable in this region. New York City would like to improve water quality in the Cannonsville Reservoir. Delaware County would like to retain dairy farms as an economic base as well as implement a locally led voluntary water quality program to retain home rule. Dairy farmers would like to remain economically viable while protecting the environment.

Cornell Cooperative Extension of Delaware County in concert with Delaware County and under the auspices of Delaware County's comprehensive watershed management strategy, developed and secured funding for a program to work with dairy farmers and their feed industry suppliers to reduce purchased feed sources of phosphorus entering their farms. This program works closely with farmers to monitor dairy cattle diets, improve and utilize homegrown feed sources and reduce, and implement more precise diet formulations that reduce reliance on purchased feed sources. The program engages faculty in the Cornell Department of Animal Science and from the USDA-Agricultural Research Service (ARS) Pasture laboratory at Penn State University to provide scientific support for in field implementation as well as for educational outreach to the local feed industry in an effort to increase their capacity to implement precision feeding on more of their client farms. Over $1.6 million of grant funding has been secured for a 4 year Precision Feed Management program in the Cannonsville Reservior.

The Precision Feed Management team has already implemented reduced phosphorus rations on several cooperating farms. On a subset of three of the cooperating farms, a Forage Systems Management process has been implemented to improve forage management and set those farms up for implementation of diets which increase utilization of homegrown forage nutrients and reduce importation of purchased feed nutrients. All three farms have begun implementation of their forage management plans and two have realized significant improvements in forage quality and yield in 2004. One farm has improved forage yields and quality two fold over previous years production. On one cooperating farm, impacts of Precision feed management to date include reducing on farm phosphorus accumulations by over 1,000 lbs per year while increasing milk production and cutting feed costs. Total increases to farm income are estimated to be over $27,000 on this farm in one year.

## Forest Fundamentals: Tools for Landowners

Approximately 40% of Cayuga County is forested. Private landowners own a vast majority of this forestland. Private forests provide raw materials for forest industries, clean air and water, wildlife habitat, open space, and recreation opportunities for Cayuga County residents. Stewardship of these forests benefits the entire community economically, ecologically, and aesthetically. There is a lack of awareness and knowledge among forest landowners about stewardship, sustainable forestry practices, where to find assistance, and how to take advantage of existing programs.

Forest Fundamentals is a workshop series targeted to non-industrial Private Forest Landowners in Central New York. Three workshops were held throughout the region focusing on the Forest Land Enhancement Program, forest stewardship planning, and how to protect forest assets.

Through the Forest Fundamentals program, 61 forest landowners learned about forest stewardship and gained knowledge of the resources and opportunities available for assistance. Collectively, participants owned over 1500 acres of forestland and after the workshops, 63% reported that they had started or had completed a forest stewardship plan as a result of their participation in the program.

**GOAL 5 – ENHANCED ECONOMIC OPPORTUNITIES AND QUALITY OF LIFE FOR AMERICANS**

Economic and social well-being are deeply intertwined through opportunities for healthy human development that is nurtured by strong families and communities. Over the next five years, the significance of the local community in economic and human development will become increasingly important as federal and state governments continue to devolve authority and accountability for employment, education, public health, social services and general enhancement of a more self-reliant population.

Cornell's research program in these areas includes faculty from the College of Human Ecology and the College of Agriculture and Life Sciences. Their interests are in economic development (especially in rural communities), human development from pre-natal through elderly stages of the life-course, and design that centers on human environment, health, and well-being. Research areas of current interest include the following:

<u>The Economy</u>

- Collaboration with New York State business and industry in fiber science such as ceramic composites, adhesion problems in fiber glass reinforced circuit boards, and fatigue of joints in plastic pipes, and application of computer-assisted design and manufacturing to the textile and apparel industry through the Apparel Industry Outreach that provides educational programming to firm in the New York metropolitan area and throughout New York State;
- Health and welfare economics, local economic effects of changes in the health sector including mandated managed care for Medicaid and Medicare recipients, consumer behavior in medical care choice and disease prevention, effects of taxation policies on alcohol consumption, health impact of unemployment, and the effects of public finance policies on low-income households and development of human capital;
- Family-based businesses and the interplay between family dynamics, inter-generation transfer of ownership, and economic viability, and time-use in households as it affects household and non-household productivity;
- Management of the nonprofit sector including improved techniques for planning and evaluation, inter-organizational collaboration at the community level, strengthened volunteer involvement in local communities, and organizational change.

<u>Family and Community</u>

- Human development and family functioning, including cognitive and personality dynamics, biological bases of personality and abnormal development, language development and intellectual growth in infancy and early childhood, the effects on human growth and development of parenting practices, family and school environments and child care programs, and the impact rural work opportunities and community resources on retirement and life-transition decision making;
- Health care cost and quality including finance and organization of health care, employer-financed health insurance, the effects of managed care on service quality, equity and access, and Medicaid and Medicare policy, health and menopause among rural women;
- Social welfare and family policies and programs including issues of child support, foster care, adoption of hard-to-place children, the effects of divorce on children, and management,

leadership and evaluation of human service organizations, food security and food resource management;
- Rural economic and community development including local government and business collaborations on job development and community decision making, rural housing quality and community vitality including issues of affordability, energy efficiency and structural integrity, rural housing conditions and children's psychological development, youth development and mentoring, housing for the elderly and disabled, interior design including furniture and facilities for the elderly, Alzheimer's patients, and child care facilities.

The Human Environment
- The effects of the physical environment on the workplace and employee including innovative workplace design, non-territorial offices, technological infrastructure, work processes, and formal and informal organizational policies and practices, home-based telecommuting and virtual work environments, the effects of ergonomic factors such as office lighting, computer stations and ventilation systems on employee health and productivity, impact of environmental toxicants such as low-level lead exposure on child development, air and water quality and toxic substance safety for households and communities;
- Innovative uses of computers in design decision making and design education, creative problem solving, human/computer interface issues, and visual, historical and cross-cultural bases of interiors, apparel and textiles;
- Health and safety issues including apparel design that protects employees from workplace contaminants and injury including HIV and other blood borne pathogens, development of new methods to determine skin exposure from pesticide contaminated clothing;
- Fiber science applications to understand the mechanics of fibrous materials, the micromechanics of failure processes, plasma surface modifications, and the development of fiber-based synthetic prostheses and surgical aids.

Future investments in research should be targeted at efforts that (1) link empirical findings to planned economic development and other extension programs; (2) integrate economic with other social science perspectives for a deeper understanding of the influence of family, organizational and community factors on long term development of human capital; (3) integrate biological and psychological approaches to healthy human development; (4) strengthen collaboration among and between business and community organizations in furtherance of economic development and the quality of community life; (5) speed the diffusion of scientific innovation to commercial development that benefits small business and community-based enterprise, (6) integrate the social sciences with information science and its application.

**PERFORMANCE GOALS FOR INITIATIVES RELATED TO GOAL 5**

**Develop the competence and character of youth and adults in families and communities.**

- build strong families;
- develop capable, responsible, and caring young people;
- promote healthy, supportive communities;
- increase financial well-being
- support informed housing choices

**Strengthen the economic and social vitality of communities.**

- empower communities so that they are viable, dynamic, and sustaining;
- expand skills of both the current and future workforce;
- leverage and apply private and public sector resources wisely;
- enhance small business development and management; and
- develop, enhance, and retain a strong agricultural industry.

**Indicator Data Specific to Goal 5**

(For each indicator, both actual and annual target results are included, the latter in parentheses.)

**INDICATOR 5.1** The total number of refereed or peer reviewed articles or materials reporting research on community or family economic or social well being.

| Year | # refereed items |
|---|---|
| **2004** | 284 (200) |

**OBJECTIVE 5.1** To increase the capacity of communities and families to enhance their own economic well-being.

**INDICATOR 5.1.2** The total number of public officials and community leaders completing non-formal education programs on economic or enterprise development and the total number of these public officials and community leaders who actually adopt one or more recommended practices to attract new businesses or help expand existing businesses within six month after completing one or more of these programs.

| Year | Output: # persons completing Programs | Outcome: # who actually adopt practices |
|---|---|---|
| **2004** | 2110 (3500) | 1205 (850) |

**OBJECTIVE 5.2** To annually improve the financial status of families through financial management education programs implemented in which CSREES partners and cooperators play an active research, education, or extension role.

**INDICATOR 5.2.1** The number of persons completing non-formal financial management education programs and the total number of these persons who actually adopt one or more

recommended practices to decrease consumer credit debt or increase savings within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt practices |
|---|---|---|
| **2004** | 16908 (10500) | 9187 (4000) |

**OBJECTIVE 5.3** To increase the capacity of communities, families, and individuals to improve their own quality of life.

**INDICATOR 5.3.1** The total number of persons completing non-formal education programs on community decision making or leadership development and the total number of these persons who actually become actively involved in one or more community projects within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually become involved |
|---|---|---|
| **2004** | 16280 (6500) | 8007 (3000) |

**OBJECTIVE 5.4** To annually increase the incidence of strong families resulting from non-formal education programs.

**INDICATOR 5.4.1** The total number of dependent care providers completing non-formal education programs and the total number of these dependent care providers who actually adopt one or more new principles, behaviors, or practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt new principles, etc. |
|---|---|---|
| **2004** | 6592 (7500) | 3646 (3200) |

**INDICATOR 5.4.2** The total number of persons completing non-formal education programs on parenting and the total number of these persons who actually adopt one or more parenting principles, behaviors, or practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt principles, etc. |
|---|---|---|
| **2004** | 17253 (20030) | 10399 (8500) |

**INDICATOR 5.4.3** The total number of persons completing non-formal education programs on youth development and the total number of these persons who actually adopt one or more youth development principles, behaviors, or practices within six months after completing one or more of these programs.

| Year | Output: # persons completing programs | Outcome: # who actually adopt principles, etc. |
|---|---|---|
| **2004** | 19773 (18000) | 14522 (11000) |

**Resources Allocated to Goal 5 (FFF and Match)**

**Dollars x 1000 and (FTE) or (SY)**

| | FY2004 Target | FY2004 Actual |
|---|---|---|
| **Extension Total** | 4,842 (80.6) | 4,518 (79.2) |
| **Research Total** | 1,825 (11.5) | 1,312 (10.3) |

## Impact Examples Related to Goal 5

### Exploring Ways to Improve the Care and Welfare of Children

More than 10 million children under age 5 spend some time in non-maternal child care while their mothers work. Children who experience high quality care are better prepared for school, have higher test scores, and have more developed social skills. One barrier to obtaining quality child care is lack of information about available options and their quality. Data has shown that parents often lack good information about the quality of child care they use and have difficulties in finding good child care. Lack of information about the quality of child care providers reduces the competitiveness of the child care market, and lowers the average quality provided.

A Hatch supported pilot project conducted by a Policy Analysis and Management researcher sought to help parents identify high quality child care by rating formal providers and disseminating a child care consumer report. Information was collected about the quality of child care providers (both center care and licensed family day care) for pre-K children in four New York counties using well-established rating systems developed by those in the child development and child care fields. This quality information was shared with parents by developing and disseminating a "Child Care Quality Consumer Report." At the same time, a quality standards and enhancement program called “Child Care Programs of Excellence” was developed and made available for implementation by providers. A survey indicated that about 80 percent of child care centers in the pilot area said the tool was used to make improvements to their services.

Several other counties are exploring ways they might also be able to offer a quality enhancing program such as Child Care Programs of Excellence. Additionally, representatives of State Senator’s office expressed interest in drafting legislation that would make a program such as Child Care Programs of Excellence available to all parents in New York State.

This Hatch-supported effort complemented and helped to shape an avenue of broader research inquiry into child care quality and services, child support in fractured families, and child welfare issues. Since receiving initial Hatch support, the faculty member has been awarded grants of $674K from NIH’s Administration for Children and Families (ACF) to explore child care quality issues and $1.5M from the National Institute of Child Health and Human Development to address aspects of child support, child welfare, and the effects of welfare reform on children.

### Understanding and Seeking Positive Human Interactions

Intrusive or intimidating social behavior can harm development of the individual and undermine the building of productive interpersonal relationships needed to succeed in the workplace, communities, schools, and other social settings. Intrusive behavior or contact can be defined as unwelcomed contact with a person, from persistent phone calls to e-mails to stalking to unannounced visits, lasting for over least two weeks in duration.

A Hatch supported researcher at Cornell in the Human Development department studied stalking behavior as an outgrowth of the dating process and other interpersonal interactions among adolescents and young adults. Some findings indicated that 20 percent of undergraduates surveyed at

two universities reported that they had been targets of such stalking behavior, with half of the incidences occurring in high school.

Twenty (20) percent of those targeted indicated that they feared for their physical safety at some point during the stalking contact, and 40 percent of targeted students believed that the experience had resulted on a negative effect on subsequent romantic relationships and on their lives in general. No correlation was found between initiation of stalking behavior by an individual and their family life situations, income, religious involvement, parenting styles, physical attractiveness, academic performance or the number or quality of friendships.

These findings have led to the development of brochures and a companion booklet that county social services agencies, police, high school and college staff, and therapists can use to provide more effective advice and counsel to adolescent victims of stalking and other forms of intrusive behavior. The research project's website (http://www.humec.cornell.edu/stalking/) contains a wide range of advice on communication, contact and law enforcement involvement strategies. Lastly, the researchers have published a study report in a major criminal justice journal (*Criminal Justice and Behavior*, Vol. 31, 2004) on intrusive contact from the stalker's point-of-view, a contribution of interest to law enforcement and justice administration agencies.

## Supporting Product and Market Development in the Nation's Fiber and Textile Related Industries

The U.S. textile and apparel industries have faced difficult times over the past three decades. This sector has seen large-scale downsizing, with the share of manufacturing employment declining from 12.1% in the 1970s to 8.1% in the 1990s. Intense import competition from low-wage developing countries in apparel and both developed and developing countries in textiles has been a major factor to contend with. The crisis facing the domestic textile and apparel industries requires increasing the competitiveness of the sector. Evidence suggests that textile and apparel firms are "reinventing" themselves, which includes increased "product" and "process" innovation. The industry's challenge is to identify the best ways to not only compete, but also lead the way in the global arena.

Through their fiber and apparel research, four faculty in Cornell's Department of Textiles and Apparel are seeking to assist the textile and apparel industry in remaining competitive through development of new products. With modest Hatch support from 1998 through 2005, the researchers have studied such issues as technology innovation in apparel manufacturing, new mass-market clothes sizing systems based on 3-D body scans, mediating environmental risks via protective textile membranes, and recycling cellulose into usable fibers and nanofibers that are environmentally friendly.

The 3-D body scanner is a new tool that is being used in research for the apparel industry and holds promise to revolutionize the way apparel is manufactured and sold. Scanning data have the potential to provide new insights into issues of sizing and fit of apparel. The apparel industry has not had access to reliable, representative data from body scans, so tools and methodologies to harness, apply, and interpret this information are critically needed. Cornell research is developing ways to objectively quantify and assess fit for the segment of the population identified by an apparel company as its target market using body scan data to visualize and quantify garment fit.

Protective clothing research has multiple aspects with the overall goal of improving performance that will be accepted by potential risk-exposed workers working in a hot, humid environment. This requires a balance between protection and thermal transport. Statistical models that can be used to predict protection and air permeability of textiles are in development.

Most fiber-reinforced composites being used today, such as graphite or glass/epoxy, are non-degradable and non-recyclable. The disposal of these composites at the end of their life is mostly through landfills. Fully biodegradable and environment-friendly "green" composites, using yearly renewable agricultural products, are being investigated for such applications. After their useful life, these composites can be conveniently disposed of or composted without harming the environment. This research uses plant based cellulose fibers as reinforcement and soy protein polymer (SPP) as resin.

Each of these researchers have used their Hatch-supported work to either pilot, approach, or propose related studies to the U.S Department of Commerce's National Textile Center, which will have awarded this group almost $3M between 2003-2008.

## Publications by Cornell Development Sociologists Guide Rural Policy

Three new books, produced by faculty in the Department of Development Sociology at Cornell University's College of Agriculture and Life Sciences, explored significant socioeconomic trends and issues occurring in New York State and the nation. The publications resulted from research partially supported by Hatch funding.

In *Critical Issues in Rural Health*, editors Nina Glasgow, Lois Wright Morton and Nan Johnson presented insights and analyses from over 40 experts on rural health in America. The contributors addressed how the rural context, including its social, cultural economic and physical structures and processes, affects the health and health care of those living in the nation's rural areas. Various chapters covered the health and health care disparities and disadvantages facing rural minorities and other groups, and also how the effects of such variations may follow those populations as "baggage" through their life course. The book offered a comprehensive overview of the health-related challenges and opportunities confronting those living or providing health services in rural regions.

In *Civic Agriculture*, author Thomas Lyson described the rebirth of locally based agricultural production and marketing systems, showing how this renaissance was closely tied to a local community's social, cultural and economic fabric. In his book, subtitled *Reconnecting Farm, Food and Community*, Lyson not only introduced the concept and underpinnings of modern-day "civic agriculture" (a term coined by Lyson and now commonly used to denote contemporary community-based food production and distribution), but also offered a critical perspective on today's highly globalized and industrialized production and marketing systems.

In *Socioeconomic Trends and Well-Being Indicators in New York State, 1950-2000*, co-authors Paul Eberts and Kris Merschrod offered demographic trend data, information and insights on the Empire State's rural, suburban and metropolitan areas over the latter half of the twentieth century, with special emphasis focused on the circumstances and needs of the state's rural counties and citizens.

*Critical Issues in Rural Health* was published by Blackwell Publishing, Ames, IA. *Civic Agriculture* was a publication of Tufts University Press/University Press of New England, Lebanon, NH. *Socioeconomic Trends and Well-Being Indicators in New York State,1950-2000* was produced by the New York State Legislative Commission on Rural Resources, Albany, NY.

## Research Finds That Environmental Risk Factors May Have Life-Long Effects On Children in Low-Income Families

Children in low-income families have long been considered higher risks in terms of their development into healthy and productive adults. A study by a Cornell environmental and developmental psychologist documents how at least two dozen psycho-social and environment factors can profoundly compromise the health and welfare of such youths in the United States, well into their adulthood.

According to a report published in *American Psychologist* (Vol.59:2, 2004) that presented the results of an overview of over 200 topically-related studies, the researcher found that low-income children are disproportionately exposed to an array of adverse social and physical environmental conditions. The report concluded that, because so many environmental risk factors cluster in their sub-standard living environments, the impacts of these conditions on such children are exacerbated, and are more likely to have debilitating long-term effects on their physical, social and cognitive development.

Children from poorer families were found to suffer from greater family turmoil, violence, instability, less responsive parental care, limited social networks, and few life enrichment activities than their middle-income counterparts. They also tended to reside in more polluted, unnatural, and crowded environments that are noiser, inferior, and more dangerous, with more crime and traffic. They are more apt to experience inadequate schools and day-care, and likely to read less. The research underscored the notion that the many risk factors affecting low-income children co-occur more frequently in their living environments, and that unfortunately researchers typically only investigate one risk factor at a time. In terms of use for public policy guidance, the study emphasizes the needs for policy makers to consider the cumulative developmental consequences of multiple risk exposures, not as just background "noise," but rather as a "catch-all" powerful influence that should not be ignored in environmental, educational, and public health and welfare policy and programs.

## Developing an Integrated Research and Extension Approach to Enhancing Rural Community Development in New York State

Rural New York in the last few decades has suffered long-term economic decline, population loss, and erosion of its job base. Traditional rural industries are being replaced by tertiary service sector jobs, while manufacturing and agricultural sectors continue a slow decline. In the years ahead, the growing older population will present serious issues for rural New York as well as for the nation. Exploration of the economic activities that may hold the most promise for producing long-term security for rural New Yorkers, the ways that Empire State communities can undertake meaningful development planning approaches, and approaches to tapping the potential of a changing population base is critical to reversing these trends.

In 2003, an integrated research and extension project, funded from both Hatch and Smith-Lever sources was begun to launch such explorations and deliberations about the State's rural community development and renewal. The overall goal was to target research on issues identified as high priority by rural development practitioners and stakeholders, so as to focus applied research and extension efforts to best influence and improve the State's and nation's rural public policy approaches.

In its first year, the project:

- gathered primary data on the State's rural population by over-sampling of rural residents taking part in the Empire State Poll;
- obtained data on specific New York rural issues, such as immigration, land use, and Native American land rights and gaming;
- prepared several extension publications based at least in part on these new research data;
- built cooperative department and faculty relationships and networks, through center and departmental support agreements, and convening of social science research roundtables and seminars focused on rural development.

Early outcomes from this project include a more organized and cooperative approach to engaging rural researchers on the topic at Cornell and elsewhere in the State. Previous rural research efforts tended to be conducted on an *ad hoc*, sporadic and loosely-connected basis. In addition, the project has succeeded in building more effective relationships between researchers, extension educators, and stakeholder users of rural research conducted at Cornell. Both of these accomplishments are reflected in refinement of the *Rural New York Initiative* concept by the Department of Development Sociology, launching of the RNYI website and enhanced interaction and collaborations with the New York State Legislative Commission on Rural resources and the New York State Rural Development Council. http://rnyi.cornell.edu/community_and_economic_development/

**Government Leadership: Moving From "Good To Great"**

Putnam County Government relies on Cornell Cooperative Extension to coordinate its professional development leadership initiative for County Government department heads, managers and top level supervisors to expand their personal leadership skills and create more effective work teams to deliver high quality, efficient, cost-effective services for Putnam County residents. The Cornell Cooperative Extension (CCE)/Community and Rural Development Institute (CaRDI) connection is instrumental to the success of the Putnam County Management Institute. With county-based Cornell Cooperative Extension leadership and faculty assistance from CaRDI, the Putnam County Management Committee developed a 5-year progressive leadership development program for Putnam County's department heads, managers and supervisors.

The CCE Executive Director provides ongoing leadership and coordination at the county level assisting the Putnam County Executive and Management Conference Planning Committee in developing goals and learning objectives and coordinating the Management Institute. CaRDI faculty assisted Putnam County Executive and Executive Management Team, along with CCE, in defining the next steps in the County's leadership development initiative, identifying Cornell staff/faculty resources, developing the Management Institute curriculum; and facilitating the Institute's sessions.

"Moving From 'Good to Great'," the theme of the 2004 Management Institute, continued building on the learning objectives of the previous Institutes which included developing personal leadership skills and facilitating organizational change. CaRDI faculty and other Cornell staff facilitated the Institute's 3-sessions (Spring, Summer, Fall) and continued to combine theory learning, personal skill assessment, and experiential learning in a yearlong leadership development experience. County department heads and managers worked between sessions identifying strategies and priorities, and developing action plans for moving Putnam County services from "good to great." More than 100 department heads, managers, and supervisors that represent the County's top management participated in this year's Management Institute. Department heads also identified non-management employees with leadership potential and 10 were selected by the County Executive and Executive Management Team to participate in the Institute.

Institute participants completed a strategic analysis for moving Putnam County services from "good to great" by identifying: trends or issues affecting the quality of services to Putnam County citizens; strengths to build on in order to better meet the citizen needs; ideas for improving current services from "good to great;" and barriers or obstacles that could prevent/ inhibit improving services to citizens. Institute participants identified and prioritized strategies and recommended action plans for moving the quality of services to the next level. The County Executive and Executive Management Team subsequently established project teams to implement the top 5 strategic initiatives. The Institute strengthens interdepartmental relationships. As a result, interdepartmental project teams enhance networking and interdepartmental relationships in a decentralized county structure. Managers and supervisors have a better understanding of the responsibilities, goals, and challenges of other departments.

## Rural Youth Employment

Youth receive inadequate information and training about the world of work. Although many youth express an interest in obtaining employment, many do not know how to seek employment or what is expected from them at the worksite. County-wide workforce preparation initiatives often fail to extend services to rural areas of the county.

Cornell Cooperative Extension of Albany County collaborated with local organizations to provide employment, education, and training services for youth throughout Albany County. The Workforce Investment Act (WIA) targeted youth in families that earn less than 70% of the poverty level including both in-school and out-of-school youth. Through the WIA program, partners linked comprehensive employment preparation services for youth with summer youth employment programs funded through Albany County. Services to rural youth were provided through the Cornell Cooperative Extension/CHOICES Program with additional supports from other service providers that did not routinely offer services outside the city of Albany. The partnership established a common intake system for eligible youth throughout Albany County. Each youth was assessed by an employment partner and a social worker to establish employment and educational goals and to identify potential barriers to these goals. The partners held weekly case reviews to coordinate and maximize services for each client and to discuss organizational matters. These services included an

assessment by a social worker with follow-up counseling and referrals for tutoring as needed. Employment preparation included: resume writing, interviewing skills, filling out application, work values, and employer expectations.

Over 300 participants were served in the 2003-2004 program year. All participants were placed in year-round or summer employment settings for direct experience. Participants placed in summer employment through the Albany County Summer Youth Employment Program received on-going training. One-hundred and seventy-nine students completed a full course of job readiness classes. Fifty-three students subsequently obtained employment outside of the program. Participants continue to receive follow-up services beyond the existence of the grant and the partnership continues to refer youth clients to other partners.

**Job Placement & Employment Project**

Tompkins County's Alternatives to Incarceration (ATI) programs include a center-based weekday program for probationers and parolees as well as for participants in the Drug Treatment Courts. Employment, education and life skills are core components of the program. Goal setting, access to resources, skill and knowledge building are all educational strategies to meet participants' and the county's vision for individual change that will impact personal lives, the jail census and ultimately the safety of our community.

Cornell Cooperative Extension of Tompkins County has been a collaborator with the Job Placement and Employment project at the Community Justice Center (CJC) for over 5 years. Goals of the job placement and employment project are to (1) develop job skills and job seeking strategies with ATI program participants, increasing their opportunities to rejoin the community as productive citizens, and (2) develop sustainable relationships with the Tompkins County business community

Activities for CJC participants are individualized and include: assistance in creating resumes and developing effective job seeking and interviewing skills, coaching to recognize transferable skills from previous work and life experiences, strategy-building to broaden their possible employment options, skill development in problem-solving and interpersonal communications to retain employment once secured, exposure to community education and employment opportunities, and, community education workshops focus on developing life skills and awareness of available community resources. Representatives of local organizations regularly include Planned Parenthood, Alternatives Federal Credit Union, Southern Tier AIDS Program, the American Red Cross. Employment workshops connect program participants with area employers to discuss employment options. Employers discuss the types of employment available with their company or agency; skills that are needed to apply; skills that can be gained on the job; employer expectations regarding conduct and performance; how a prospective applicant might discuss their legal history or treatment background, etc.

Outcomes of the project during FY03-04 include: 295 participants gained employment skills training, 160 received career readiness assessments, 142 wrote resumes, 170 participated in job placement efforts. Of the participants, 63 obtained employment (of 160 who were eligible to work). In addition, area businesses and employers gain understanding of alternatives to incarceration

programs and the resulting pool of potential employees aand identify government incentives for hiring ex-offenders. Such numbers mask personal impacts, for example, one former participant recently stopped by beaming with excitement. He had come to let us know that he was preparing to leave his job as a laborer - because he had just accepted a position as a counselor working with at-risk youth!

**STAKEHOLDER INPUT PROCESS**

During this reporting period, the stakeholder input approach to statewide program development jointly utilized by Cornell Cooperative Extension (CCE), the Cornell University Agricultural Experiment Station (CUAES), and the New York State Agricultural Experiment Station (NYSAES) since February 2001 continued to develop and mature. Program advisory councils and program work teams worked to improve program focus, relevance and priority setting, and, program development via greater stakeholder engagement, campus-field staff interaction, and research-extension integration.

Five Program Councils address each of the common CCE/CUAES theme areas (*Community and Economic Vitality, Quality of Life for Individuals and Families, Natural Resources and Environment, Youth Development,* and *Agriculture and Food Systems*). Each council is composed of external stakeholders, Cornell department chairs, and county extension association executive directors. In all, the total number of individuals serving on the councils tallies over 130, including more than 60 persons external to the university or the extension associations. The Councils advise the directors of CCE and CUAES on annual statewide program priorities, review PWT performance and "gaps" in programmatic coverage, and comment on the relevancy of preproposals seeking FFF support.

For the FY04-05 FFF funding cycle, the Program Councils were challenged by the directors of CCE/CUAES/NYSAES to develop more highly focused priorities. Previously, the councils (and their predecessor advisory committees) developed and conveyed long lists of detailed annual program priorities in each of their theme areas for inclusion in the FFF RFP. By June 2004, the councils succeeded in identifying a limited number of critical priorities in each theme area to be addressed in faculty preproposals. These priorities are incorporated in our FY05-06 Plan of Work Update. For the FY05-06 FFF funding cycle, these same priorities were used again to guide preproposal submission. We continue to directly involve stakeholders in reviewing project proposals for relevancy. For example, in the current proposal process for FY06, we received over 1500 reviews of the 113 preproposals submitted. Those reviews will help us to assess the real-world relevancy of those preproposals and how well they align with priorities developed by the councils.

Based mainly upon a desire to explore alternative ways to engage Program Council and other external stakeholders more fully and conveniently in research and extension program development and planning, the annual Program Council conference, typically held in mid-winter on the Cornell campus, was deferred. In lieu of convening physically, council members were communicated with via electronic means, including via the dissemination of an electronic, web-based newsletter called *P.C. Update* (http://cuaes.cornell.edu/CUAESWeb/links_page.htm). Council members at previous conferences suggested the idea for such a newsletter. In addition, in 2005 and 2006, we will be engaging council members with web-based surveys and other interactive means as part of a process to have them more directly participate in development of our 2007-11 federal plan-of-work.

A publicly-accessible website (http://www.cce.cornell.edu/admin/program/pwts) provides comprehensive background and details about the Program Council-Program Work Team structure and process, including listings of works teams and councils, membership information, public announcements, originating PWT petitions, and PWT annual reports.

Since 2001, thirty-eight (38) program work teams have been authorized and supported to develop and deliver integrated applied research and extension programming across the state. All PWTs are self-selected and self-directed affinity groups of external stakeholders, county extension educators, and campus-based researchers and extension specialists. PWTs were required to identify program needs in their selected issue areas and carry forth plans of work to meet those needs. PWTs were expected to nurture research-extension integration, to encourage campus-field interactions and collaborations, to take multi-disciplinary approaches, to evaluate their efforts, and to involve their external members in all aspects of their work. They were also expected to seek external funding support, and to report annually on their accomplishments to an appropriate Program Council. PWTs were sanctioned for 2 or 3 years. Approximately 750 individuals serve on at least one PWT, including more than 260 external stakeholders. The externals come from the business, banking, local/state/federal government, non-government organization and educational sectors.

Noteworthy in 2004 was the decision by 29 teams to continue their program development efforts despite the terming of their annual operational FFF support. Projects proposed as part of the teams' transitioning to this new unfunded status were reviewed and approved. A listing of these projects can be viewed at http://www.cce.cornell.edu/admin/program/pwts/trans.htm
In addition, in 2004 a new unfunded PWT on parenting education was formed by interested faculty and educators.

Beyond the new program development and stakeholder input structure/process, each of Cornell Cooperative Extension's 55 county extension associations continued to work closely with stakeholders in their counties via participation in their local governance (i.e. board of directors) and program guidance (i.e., advisory committee) structures. Formal advisory committees were also used to guide New York City Extension programs. In 2002, a statewide Council of Extension Associations was established, providing another venue for enhanced stakeholder input and engagement within the CCE system. Well over 50,000 stakeholder volunteers from all walks of life continued to participate and assist in the direction, priority setting, and delivery of extension programs throughout the state. CCE local plans of work undergo formal review every four years and are updated at the mid point of the four-year period.

Lastly, the colleges of Agriculture and Life Sciences and Human Ecology, and numerous academic departments and specialized programs within those colleges maintain active advisory committees or councils having broad external stakeholder representation. These groups help to bring relevancy and focus to program decision-making and investments.

## PROGRAM REVIEW PROCESSES

The program review process was again revised in 2004 to reflect our new program development and stakeholder involvement processes.

**Review Process (Research Projects and Extension Projects with Designated Funding)**

0. Principal investigators are asked to consult program priorities (established as outlined in the stakeholder involvement section above) and develop short pre-proposals for new or revised projects funded by Federal Formula Funds. In 2004 (for projects to be funded beginning on October 1, 2005), prospective principal investigators were strongly encouraged to submit fully integrated (research and extension) preproposals. They were provided with a special web-submission gateway for such integrated preproposals.
0. Pre-proposals are reviewed for purpose and relevancy by advisory Program Councils (see Stakeholder Involvement section) and other external stakeholders, the principal investigator's department chair, Extension Program Associate/Assistant Directors, and the Experiment Station directorates (Ithaca and Geneva). A revised review form was developed for use by off-campus stakeholders, and web submission of reviews was made possible in 2005. Pre-proposals are discussed with department chairs during annual budget conferences to put work in broader perspective of department program.
0. Pre-proposals are accepted/rejected; accepted proposals are developed into full project outlines by the Principal Investigator.

**For research proposals:**

0. The Department Chair recommends two or three peer reviewers to the Director's Office.
0. The Director's Office obtains the necessary reviews in accordance with CSREES rules using standard format.
0. Changes suggested by the peer reviewer are conveyed to the Principal Investigator. Peer reviewer names are not revealed to the Principal Investigator.
0. The revised proposal, with required CRIS forms, is submitted to the Director's Office.
0. The Director's Office submits the package to CSREES along with an attached statement certifying the peer review was completed.
0. Reviews are kept on file in the Director's Office.
0. The Director's Office attaches a statement to the proposal and sends this with the proposal and Form 10 to the CALS Research Office.
0. After approval by CSREES, funds are allocated to the appropriate research account.

**For extension proposals:**

4. Extension Program Directors receive Program Council and Dept. Chair comments on extension preproposals related to their program areas.
4. Extension Program Directors rank/recommend extension preproposals.
4. Extension Program Directors meet with Experiment Station (Ithaca and Geneva) staff to discuss potential R-E linkages among extension preproposals.
4. Extension Program Directors finalize Smith-Lever funding recommendations and communicate decisions and needed modifications

**Cornell Review Criteria**

0. Anticipated significance of results relative to current priority needs or opportunities
0. Scientific merit of objectives
0. Clarity of objectives
0. Appropriate methodology
0. Feasibility of attaining objectives
0. Accomplishment during preceding project (for revisions)
0. Research performance and competence of investigator(s)
0. Relevance of the proposed work to regional or national goals
0. Level of research-extension integration

**Review Process Calendar** The calendar of our new, integrated research and extension review process follows below (dates are approximate):

| Date | Step |
|---|---|
| SEP 20 | Priorities finalized for federal formula funds (FFF) preproposal RFP |
| OCT 1 | RFP for preproposals issued |
| NOV 15 | Deadline for FFF preproposal submission |
| DEC 3-JAN 15 | Preproposals provided to Program Councils for review |
| JAN 13-17 | Annual Program Council Conferences (campus); discussions held on preproposal relevance. Preproposals available to P.I.s' department chair on-line for review and comment |
| FEB 25 | Extension Program Directors' written comments on program-related RESEARCH preproposals due. Deadline for Program Councils and department chairs to comment on all preproposals. |
| | |
| MAR 6 | Extension Program Directors receive Program Council and Dept. Chair comments on extension preproposals related to their program areas |
| MAR 9 – APR 30 | CCE-CUAES program conferences with department chairs |
| MAR 18 | Extension Program Directors rank/recommend EXTENSION preproposals Recommendations are forwarded to CCE director and CCE Assoc. Director for Finance |
| APR 1 | Extension Program Directors meet with Experiment Station (Ithaca and Geneva) staff to discuss potential R-E linkages among extension preproposals |
| APR 8 | Extension Program Directors meet to finalize Smith-Lever funding recommendations, which are then forwarded to CCE Director and CCE Associate Director for Finance |
| APR 1-15 | CUAES and NYSAES Directors consider all research preproposals and make tentative funding decisions |
| APR 15-30 | Joint session of CUAES, NYSAES and CCE Directors and Extension Program Directors to discuss/coordinate funding decisions and notification |
| MAY 15-30 | FFF preproposal decisions communicated to principal investigators and Program Councils |
| JULY 1 | FFF full proposals due |
| JUL-AUG | FFF full proposals peer reviewed |
| AUG | Focused priorities identified by Program Councils are incorporated into the RFP for the next FFF cycle |
| OCT 1 | FFF FY begins; proposed projects funded |

## EXTENSION MERIT REVIEW

As described above, our governance and advisory structures, including the Program Councils, serve primary roles in identifying and determining merit of extension initiatives. In addition, program conferences are conducted with each academic department. In those sessions, extension and applied research priorities of each unit are discussed, accomplishments are summarized in general (e.g., number of educational activities, number of people attending, number of fact sheets, bulletins, videos, documented outcomes and impacts, etc.), and products and outcomes from funded projects are reviewed. The indicators of performance are discussed relative to current program priorities, and extension investments for each unit are adjusted accordingly. Extension projects receiving designated funding are an integral part of the review process outlined above. Final funding decisions are recommended by the extension program directors, whom serve as liaisons to Program Councils and work closely with a number of Program Work Teams. In 2004, we implemented a reporting system for funded extension projects that directly parallels the CRIS system for research reporting. The new system includes reports of outcomes against original project goals which should enhance integrity of the merit review process.

## MULTISTATE AND JOINT ACTIVITIES

Our multistate, multi-institutional, and multi-disciplinary activities occur within the same stakeholder involvement and program development processes as in-state activities and, as such, are directed to priority needs of priority audiences. Our program development structure for federal formula funds is interdisciplinary by definition (see stakeholder involvement and review processes above). All projects are expected to outline expected outcomes and report against them. We have taken steps to strengthen specific documentation of integrated activity and multistate programs and have included evidence of such activity directly in our pre-proposal and reporting criteria. The fundamental purposes of these efforts are to strengthen quality of programming by bringing together required disciplines and to ensure efficient use and maximum leveraging of federal formula funds. The sections below and Appendices B and C provide additional detail.

## MULTISTATE EXTENSION ACTIVITIES

When we set our multistate extension goals, we challenged our system by significantly exceeding what would have been the minimum required target based on 1997 expenditures. The mandated minimum based on this calculation would have been only about 1% of expenditures. Rather, we set targets of 3%, 8%, and 12% for FY00, FY01, FY02 and beyond because we believe fundamentally in the value of multistate collaboration. We are pleased to report that we have met our 12% target for the fourth year in a row despite budget pressure within New York and collaborating states that greatly reduces flexibility for undertaking new multistate initiatives. Multistate extension activity is documented in Appendix B.

## INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

During 2004 we continued and expanded upon our integrated research and extension collaborative strategy as outlined in the approved plan of work. Please see the Stakeholder Involvement Section above for a description of our ongoing collaborative program planning and development approaches. Background information on our program development structure and process is available at: http://www.cce.cornell.edu/admin/program/pwts/ Specific documentation of integrated activities is included in Appendix C.

**MULTI-COUNTY INITIATIVES**

Multi-county initiatives are fostered through active encouragement of formal and non-formal program partnerships. At present time, there are 8 regional extension program teams involving 30 counties in which Cornell University is a formal funding partner. In addition, at least 12 collaborative relationships involving at least 30 counties exist without formal Cornell sponsorship. In recognition of the importance of multi-county initiatives, we currently are in the recruitment process for a multi-county team coordinator for agriculture programs, a major investment in today's fiscal climate.

As previously reported, electronic connectivity is one of our key strategies for promoting multi-county initiatives. We continue to add to our regional network of electronic classrooms and now have more than 20 across all regions of New York State. These are used increasingly for collaborative programming and professional development as well as facilitating internal advisement and governance by connecting partners across many sites.

In addition, we have established a regional communications structure wherein one of the county extension executive directors serves as convener for each of eight communication regions to promote collaboration and resource sharing. The conveners meet regularly with the CCE Director as a "Directors Cabinet" to address system issues.

**Appendix A – FY03-04 Applied Research and Extension Priorities Identified by Program Councils**

## Natural Resources and Environment Priorities

(Program Council ranking by order of importance, high to low)

- Managing agricultural and environmental resources for long-term sustainable solutions that reduce use of chemical pesticides and fossil fuels
- Refining land use planning approaches and practices, especially growth management strategies that reduce water quality impacts
- Improving livestock waste management systems and approaches to control odor and reduce other environmental problems
- Analyzing and restoring watersheds, especially via incentive-based approaches to total maximum daily load (TMDL) implementation, and evaluation of where TMDLs are as appropriate management strategy
- Improving upland watershed management practices to lessen adverse impacts on estuary and marine water quality
- Improving the management of natural resources, especially with regard to recreation and tourism, commercial harvesting, human-animal conflicts (deer and birds, specifically management of Canadian geese), and park management
- Exploring alternative energy usage in agriculture
- Managing the impacts of climate change
- Developing competitive alternative agricultural productions systems
- Enhancing urban and community forestry and related management practices
- Assessing personal care product and prescription drug impacts on run-off and drinking water
- Studying salt-to-fresh water conversion feasibility and alternatives, as made necessary in times of drought, especially for Hudson River communities
- Analyzing and improving indoor air quality

## Community and Economic Vitality Priorities

Building community capacity based on comprehensive research, models and tools

- community leadership and governance
- community visioning and strategic planning
- sustainable economic development

Developing effective and collaborative land use management approaches and policies that enhance connections among economic, environmental and infrastructure issues

- main street revitalization, working landscapes, water quality, affordable housing
- smart growth/quality communities
- rural-urban interface

Nurturing non-profit and neighborhood group development

- leadership and volunteer development
- grant writing and fund development education

Advancing community based agricultural economic development

- mainstreaming agricultural economic development
- enhancing local food systems (rural, suburban and urban)

Promoting workforce and entrepreneurial development
- strategic workforce development planning
- workforce composition research
- financial management education
- e-commerce

Cross-cutting themes (for these priorities)
- improving Public Issues education and community decision making approaches
- including and reaching out to under-represented groups
- promoting citizenship and community participation
- building collaborative partnerships

## Quality of Life for Individuals and Families Priorities

(Numbers within each grouping indicate rank order)

Overarching Priority: Promoting Tolerance and Acceptance; Embracing Diversity

Group A--Nutrition, Health, and Wellness
0. Advancing healthy lifestyles, safety, and wellness
0. Improving food security
0. Enhancing competence in practice of nutrition

Group B--Life Course
0. Improving caregiving for children and elders
0. Strengthening family support across the life course--young to aging families and elders
0. Reducing stress and violence

Group C--Environments
0. Improving the quality of housing, home and grounds, school, and workplace environments and the horticultural environment in our communities.

Group D--Family and Consumer Economics
0. Enhancing personal skills in household economics, financial literacy, and resource management.

## Agriculture and Food Systems Priorities

(The italicized items (1-6) were given clear consensus priority by the Agriculture and Food Systems Program Council.)
- *Managing animal wastes through whole farm nutrient management plans and practices*
- *Managing human resources, especially related to identifying, hiring, and retaining new workers and the education of middle management and owners*
- *Identifying market channels for value-added products*
- *Minimizing biohazards in the food chain*
- *Managing risk to reduce stress on resources and increase stress resistance*
- *Increasing production efficiency*

- Improving product quality
- Promoting NYS agriculture to youth, non-farm citizens, and the world's consumers
- Understanding and promoting agricultural economic development within the context of community
- Improving weed controls and developing herbicide resistant crops

- Educating the public on health related to genetically engineered organisms (GEOs)
- Managing turf grass
- Improving water resource management using precision agriculture and irrigation
- Managing farm business product pricing, profit maximization, and decision making
- Studying and advancing intra and interstate regionalism
- Enhancing animal welfare
- Meeting the challenge of competitive imports, especially Canadian
- Marketing agricultural products
- Analyzing agricultural businesses
- Creating new plant varieties
- Understanding the impact of retail level consolidations on production agriculture
- Increasing the efficiency and value of food manufacturing and marketing operations across agriculture

## Youth Development Priorities

- Defining and applying principles of positive youth development
- Defining curricular standards
- Advancing life skill development (e.g., workforce/ career development, citizenship, caring, success in education)
- Enhancing science and technology literacy
- Developing and applying youth community service models and methods

**Appendix B – Multistate Extension Activities Report**

**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** Cornell University
**State** New York

Check one: **_X_ Multistate Extension Activities**

| Title of Planned Program/Activity | FY2004 Expenditures |
|---|---|
| Indoor Air Quality | 13,000 |
| Potato Breeding | 10,000 |
| Managing Waste | 70,000 |
| Innovative Extension Programs for Small Farms | 29,410 |
| Revitalizing Iroquois Communities | 12,938 |
| Family & Social Welfare | 38,000 |
| Community and Rural Development Outreach | 18,000 |
| Farm Net | 12,500 |
| 4-H Horse Program | 36,000 |
| Fiber Science & Textile Program for Youth | 25,000 |
| Crop and Seed Improvement Project | 3,500 |
| 4-H Plant Science Program | 36,500 |
| Landscape Horticulture Professional Education | 38,000 |
| Migrant Farmworker Education | 53,000 |
| Water Quality Education for Individuals and Communities | 10,500 |
| Insects: Biology and Pest Management for Adults and Youth | 45,000 |
| Early Childhood and Parent Education | 15,000 |
| Food & Nutrition Prof Dev Initiative | 95,096 |
| Nutrition in 4-H Youth Development | 38,000 |
| Health and Safety Issues Related to Textiles and Clothing | 14,929 |
| Youth at Risk | 13,000 |
| Family Economics & Resource Management | 40,000 |
| Health Policy | 39,000 |
| Building Capacity and Sustainability in Workforce Food Systems | 172,000 |
| Development of Synchronous & Asynchronous Hort-Dist. Learning | 20,500 |
| Youth Program Training, & Policy Development | 90,850 |
| Enhancing Youth Voice with Youth as Evaluation Partners | 15,000 |
| Calibration of Simple Amino-Sugar Soil Testing | 38,500 |
| Online Community Profile Approach to Accessing Community Data | 19,000 |
| Home Grounds and Community Horticulture | 68,000 |
| Engineering Aspects of Animal Waste Management Education | 60,000 |
| Youth Community Action | 25,000 |
| Plant Health Education | 11,000 |

| | |
|---|---|
| Animal Behavior: Train the Trainer Model for Youth and Adult Volunteer Dog Trainers | 5,525 |
| Implementation of Precision Feeding Approaches to Reduce Nutrient Excretion in Manure | 13,069 |
| Parenting in Context | 27,500 |
| Workforce Development in Elder Care: An Evaluation of Innovative Training Methods | 32,500 |
| Building Leadership for a Productive Satisfied Hispanic Workforce | 33,000 |
| Practical Management of Indoor Environmental Risks | 25,000 |
| Strategic Marketing Education for the Horticultural Industries | 11,000 |
| Creating New Partnerships and Tools for Local Government Education | 10,000 |
| Fertilizer Recommendations for Field Crops – The Basis for Environmentally and Economically Sound Nutrient Management | 25,000 |
| Main Street Revitalization: Building Capacity for Community Economic Development | 15,000 |
| Strengthening New York's Economy and Communities through Agriculture and Food Partnerships | 7,000 |
| Dissemination of Horticultural Information to the Ornamental and Vegetable Industries | 8,000 |
| Natural Resource, Agriculture and Engineering. Service | 15,943 |
| West Nile Virus Education | 35,000 |
| Northern New York Program | 12,000 |
| Lake Erie Regional Grape Program | 16,022 |
| Diversity Program | 39,144 |
| **Total** | **1,556,926** |

Helene R.Dillard March 1, 2005
Form CSREES-RPT (2/00)

**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**
**Brief Summaries**

**Institution** Cornell University
**State** New York

Check one: **_X_ Multistate Extension Activities**
**___ Integrated Activities (Hatch Act Funds)**
**___ Integrated Activities (Smith-Lever Act Funds)**

Our total multistate extension expenditures of $1,556,926 represents 17.5 % of our total FY04 approved Smith Lever 3b & 3c funding of $8,908,045 exceeding our FY2003 target of 12.0%. The FY2004 project listing follows.

Indoor Air Quality
This is a project of the Department of Design and Environmental Analysis that develops approaches to protect public health by reducing risks associated with indoor air pollution. It is a joint training project with New Jersey and linked to the CSREES/HUD nationwide "Healthy Homes Initiative."

Potato Breeding
This Plant Breeding Department aims to develop grower/processor consensus for release of improved potato varieties. This is related to a northeast regional project and involves cooperators in Pennsylvania, Maine, New Jersey, Virginia, and North Carolina.

Managing Wastes
This project based in the Center for the Environment works to improve management and recycling of organic residuals from farms, residences, institutions and businesses through new and continued research and outreach programs. It is part of a broader multistate effort that involves New Hampshire, Pennsylvania, Massachusetts, and New Jersey.

Innovative Extension Programs for Small Farms This multidisciplinary projects focuses on economic viability of small farms and the contributions of small farms to the economic vitality and aesthetics of their communities. The project is part of the NESARE effort and there is a strong working relationship with the New England Small Farm Institute.

Revitalizing Iroquois Communities: Strengthening Cultural Traditions Through Natural Resource Initiatives Specific areas addressed include fisheries, native plant restoration, and an integrated language/horticultural curriculum for use in reservation schools. Extensive ties exist with Tribal Colleges extension programs.

Family and Social Welfare
This project of the Department of Policy Analysis and Management aims to strengthen public sector responses to community issues. It involves multi-state instructional resource development and sharing with Pennsylvania and Kentucky being key partners.

Community and Rural Development Outreach This project focuses on management practices of non-profit organizations in communities, public policy education, and local government planning and evaluation. Key partnerships have been established with Penn State and the University of Kentucky.

Farm Net
The primary purpose of this Applied Economics and Management department based program is to develop and sustain strong farming families often in the face of significant stress. There are ongoing collaborative relationships with similar programs in New England, Pennsyslvania, Iowa, and Wisconsin and additional connections with New Jersey and Maryland.

4-H Horse Program
This Animal Science Department effort is a broad educational program addressing animal science, equine science, veterinary science, animal welfare, health and diseases, etc. Important multistate collaborations include the American outh Horse Council and the Northeast Regional Leaders Forum. Collaborative training initiatives have involved Pennsylvania and New Jersey.

Fiber Science & Textile Program for Youth
This project of the Department of Textiles and Apparel included developing and evaluating a broad textile program for youth that includes fiber science, lifeskills, community service, co mputer pattern-making, and cultural arts. Eleven states are participating on a design team.

Crop and Seed Improvement Project
This is a project of the Department of Plant Breeding to develop and promote use of foundation and certified seeds of superior crop varieties. Collaborators include the Northeast Seed Alliance and resource persons particularly in Pennsylvania and Maine.

4-H Plant Science Program This Horticulture Department project is to develop, implement and evaluate materials for youth and adult gardening audiences that address core principles of the plant sciences. Direct collaboration occurs with a Texas A&M faculty member and several regional and national gardening organizations.

Landscape Horticulture Professional Education This Horticulture Department project develops, implements, and evaluates programs on environmentally responsible turfgrass and landscape management that results in reduced reliance on pesticides. Direct collaboration occurs with campus experts across the northeast region and national sources.

Migrant Farmworker Education The program works to educate farmworkers, service professionals, educators and officials on the situation and needs of farmworkers and associated public policy issues. Strong program ties exist nationally particularly through the national Change Agent States for Diversity Initiative.

Water Quality Education for Individuals & Community
A project of the Department of Textiles and Apparel, this effort focuses on household water supplies and watershed protection. It is linked to several multistate and national initiatives including Home*A*Syst and the NEMO project.

Insects Biology and Pest Management for Adults and Youth
This is a project of the Department of Entomology to develop educational materials that can be readily adapted by school, after school, and informal educational programs for youth in the subject area of entomology and gardening. Direct collaboration occurs with several northeastern states.

Early Childhood and Parent Education This is a program of the Human Development Department. Goals are to enhance caregiver roles and quality of available childcare and to better connect current research with educational programming. This is part of the national extension childcare initiative.

Food & Nutrition Professional Development Initiative
This is a project of the Division of Nutritional Sciences intended to provide the latest research-based information to professionals, paraprofessionals, and educators in food and nutrition related fields. It includes the nationally used WWW resource "Ask the Nutrition Expert" and involves collaborators in many states via active list-servs.

Nutrition in 4-H Youth Development This Division of Nutritional Sciences project includes curriculum development and efforts to strengthen relationships between 4-H and EFNEP. Collaboration includes participation in a national EFNEP/FSNEP Youth Evaluation Work Group.

Health & Safety Issues Related to Textiles & Clothing
This Department of Textiles and Apparel project focuses on textiles and clothing systems and worker practices and attitudes relative to reducing pesticide exposure of handlers, workers, and their families. Collaborating states include California, Iowa, Illinois, Maryland, Michigan, Nebraska, Oklahoma, and Texas.

Youth at Risk Support
This Department of Human Development effort is part of the national CYFAR project. Purposes include assisting schools and community groups to increase capability to design and implement appropriate programs for youth. The Teen Assessment component is conducted in direct collaboration with University of Wisconsin Extension.

Family Economics and Resource Management
This project based in the Department of Policy Analysis and Management includes colleagues in four Cornell Departments and land grant collaborators in Minnesota and New Jersey. It is directed to creating financial management curricula for use by teachers, human service providers, and community organizations.

Health Policy
This Department of Policy Analysis and Management project focuses on rural health policy and includes participation Rural Health Alliances in neighboring states.

Building Capacity and Sustainability in Extension Workforce Development Programs for the Food System
This program is based in the Departments of Education and Policy Analysis and Management and includes collaborators at Rutgers, Delaware State University, and Penn State University. It is a comprehensive package of workforce needs assessment and training through various employment related organizations.

Development of Synchronous and Asynchronous Horticulture Distance Learning for Cooperative Extension
Based in the Horticulture Department, this project is working with the Natural Resource, Agriculture and Engineering Service to develop and deliver this effort through the 14 northeast land grant colleges. It includes modules for both commercial and consumer horticulture audiences.

Youth Development Training and Policy Development
This Department of Human Development based project includes collaborators in Wisconsin and California and many private youth organizations. It is both a professional development strategy for youth service providers and a means for informing local youth policy development.

Enhancing Youth Voice with Youth as Evaluation Partners
This Human Development Department project explores current practices for effectively involving youth in program planning and evaluation. Key collaborators include WI and MI.

Calibration of a Simple Amino-Sugar Soil Test for Determining Sites that are Non-Responsive to N Fertilization of Corn
The Crop and Soil Sciences Department in collaboration with University of Illinois is conducting this field test of an approach developed at the University of Illinois.

Online Community Profile Approach to Accessing Community Data
Local elected and appointed officials, state agency and local government association staffers will have ready access to key data for use in decision-making and grant writing. This is being developed in collaboration with Penn State.

Home Grounds and Community Horticulture
This Horticulture Department project explores connections between home gardening and landscaping improves real estate value and community improvement initiatives. The project involves northeast regional Master Gardener training.

Engineering Aspects of Animal Waste Management Education Develop, document, and demonstrate manure treatment and handling methods for NYS dairy farms that will allow them to effectively and economically implement their Comprehensive Nutrient Management Plans. Collaborating states: NE, VT, CT, PA, and WI.

Youth Community Action stimulate an increase in YCA programming in areas of service-learning, civic engagement, youth in governance, civics programs, and community asset mapping. Collaborating states: NH and WI.

Plant Health Education The objective is to ensure that homeowners who get their information from county CCE offices through Master Gardeners are receiving information that is accurate and offers them the best opportunity for managing plant disease problems in a way that least threatens them and their environment. Collaborating states: national collaboration on diagnostic clinic.

Animal Behavior: Train the Trainer Model for Youth and Adult Volunteer Dog Trainers Focus is on development of comprehensive and consistent volunteer training programs. Multi-state contribution through the national 4-H juried curriculum system.

Implementation of Precision Feeding Approaches to Reduce Nutrient Excretion in Manure Objectives are to increase the adoption of precision feeding through use of the CNCPS ration formulation model by the feed industry in New York and to use commercial dairy farms to demonstrate the reductions in nitrogen and phosphorus excretion that can be attained using the CNCPS model. Collaborating states: VT and CA.

Parenting in Context
This is a joint project of the Department of Policy Analysis and Management and the Human Development Department. The goal of this project is to promote the integration of research and extension activities around parenting. This project focuses specifically on the issue of parenting in context, or the ways in which neighborhoods influence parenting behaviors. The project will contribute to and benefit from curriculum development nationwide based on the involvement of the principle investigators on national parenting education initiatives.

Workforce Development in Elder Care: An Evaluation of Innovative Training Methods This project merges two key CCE programmatic interests: workforce development and improving quality of life for elders. Goal: Improve performance, recruitment, and retention by creating innovative and cost-effective training for direct-service workers in eldercare. Collaborating states: NJ

Building Leadership for a Productive Satisfied Hispanic Workforce Employers will better understand the needs of their Hispanic employees and will develop human resource strategies to meet those needs consistent with the needs of the business. Agricultural employers and policy makers will understand Hispanic workforce issues and become engaged in immigration reform policy as it relates to the Hispanic workforce. Employers will take a leadership role in fostering acceptance and understanding of Hispanic workers in their communities. Collaborating states: PA, VT, CT, NH, MA, and ME.

Practical Management of Indoor Environmental Risks Intent is to apply knowledge gained from two research projects, Healthy Living and Learning Environments and Practical Management Strategies to reduce Risks of Exposure to Indoor Environmental Pollutants, to teach limited resource households--through trained Peer Educators--proven techniques to minimize health risks. Healthy Indoor Air for America's Homes is a national Extension program funded through a cooperative agreement between USDA/CSREES and the U.S. EPA.

Strategic Marketing Education for the Horticultural Industries The overall goal of this project is to provide marketing education to improve marketing competency among industry members in horticultural industries (fruit, vegetable and ornamental sectors) and educators who work with these sectors. Collaborating state: MI.

Creating New Partnerships and Tools for Local Government Education
The project goal is to improve the capacity and performance of local governments in New York State by improving the training opportunities and information/decision-making resources available to local elected leaders and citizens. Project leaders are linking to efforts in OH, MD, and VT.

Fertilizer Recommendations for Field Crops – The Basis for Environmentally and Economically Sound Nutrient Management The overall goal is to improve farm profitability while protecting the environment and having the basis for our current fertilizer recommendations fully documented is essential in obtaining this goal. Collaborating states: The PI is the Cornell representative for NEC-67, a group of faculty and staff at Northeastern US land grant universities. NE is another active collaborator.

Main Street Revitalization: Building Capacity for Community Economic Development The MSR process promotes sustainable development because the communities themselves determine program direction: through a community visioning and planning process, communities identify problems to be addressed and strategies to be pursued. Collaborating states: WI and PA.

Strengthening New York's Economy and Communities through Agriculture and Food Partnerships Goals include strengthening inter-agency working relationships between professionals pursuing agriculture and economic development (agriculture developers, economic developers and community developers, planners, etc.) and supporting public issues education on the topic of agriculture economic development. Collaborating states: Northeastern states through collaborative research and resource development.

Dissemination of Horticultural Information to the Ornamental and Vegetable Industries
Objectives include: To improve productivity and profitability of ornamental and vegetable crop operations by delineating practices that reduce input costs and increase yields to boost profits, To diagnose and provide treatment recommendations for disease, insect and weed problems for businesses growing or maintaining ornamental and vegetable plants, and, to highlight and showcase ongoing applied research and share information about new reduced-risk plant protectant materials, IPM methods, and best management practices. Collaborating states: CT and NJ and other New England and Mid-Atlantic states.

Natural Resource, Agricultural, and Engineering Service
This is a regional effort based in the Biological and Environmental Engineering Department. Purposes are to improve competitiveness and sustainability of agricultural and natural resource enterprises and promoting food safety and environmental enhancement. Primary activities include publishing resource materials and conducting conferences on current issues. Thirteen states plus the District of Columbia currently participate. For more info: http://www.nraes.org

West Nile Virus Education
This project now is based in the Environmental Risk Analysis Program of the Communication Department. It included extensive collaboration with states in the New York Metropolitan area and elsewhere. For information: http://environmentalrisk.cornell.edu/WNV/

Northern New York Program
The Northern New York Agricultural Development Program is a farmer-driven agricultural research and education program that selects and conducts applied research projects, the results of which can be practically applied to farms across Northern New York and elsewhere. The project has strong ties with Vermont extension and others throughout the Northeast.

Lake Erie Regional Grape Program
On-going, joint research and extension program with Penn State serving the grape industry along Lake Erie. For more info: http://lenewa.netsync.net/public/lergphom.htm

Diversity Program
Cornell Cooperative Extension is one of the Change Agent States for Diversity national initiative. Key resources are available at: http://www.cce.cornell.edu/diversity/

**APPENDIX C – INTEGRATED ACTIVITIES REPORT**

**Form CSREES-REPT (2/00)**

**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** Cornell University
**State** New York

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

| **Title of Planned Program/Activity** | **Expenditures FY2004** |
|---|---|
| Research/Extension Integration Grants Program | 208,026 |
| Departmental Support for Integrated Activities | 1,095,002 |
| **Total** | **$1,303,028** |

Daniel J. Decker, Director — April 1, 2005, Date

Form CSREES-REPORT (2/00)

**Form CSREES-REPT (2/00) – Smith-Lever**

**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** Cornell University
**State** New York

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

| **Title of Planned Program/Activity** | **Expenditures FY2004** |
|---|---|
| Program Work Teams & Other Projects | 118,714 |
| Departmental Support for Integrated Activities | 2,255,349 |
| **Total** | **$2,374,062** |

Helene R. Dillard — Director
April 1, 2005 — Date

Form CSREES-REPORT (2/00)

**Form CSREES-REPT (2/00) – Hatch and Smith-Lever Integrated Activities Narrative**

**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**
**Brief Narrative**

**Institution** Cornell University
**State** New York

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

For the past decade, we have progressively integrated planning processes for federal formula fund allocation for research and extension. Our joint plan of work was a natural extension of that effort. In the first year of this plan, our joint research and extension Statewide Program Committees reviewed virtually all project support proposals and allocations were made reflecting that input. Now that the Program Council/Program Work Team structure—that replaced the Statewide Program Committees—is in place (see Stakeholder Involvement section), Program Councils establish priorities that guide our call for proposals and provide relevancy reviews for all proposals. In identifying our target percentages for integrated activities, and in accordance with the final administrative guidance, we used two criteria:

0. Review and support of projects by Program Councils, OR,
0. Support to persons with joint appointments
- Research-to-Practice Partnership in the Evaluation of Community Nutrition Outcomes for Low Income Audiences

**Program Work Teams and Associated Projects**
Our research/extension Program Work Teams (PWTs) are described specifically in the Stakeholder Involvement section of this report. During FY04, $118,714 of S-L funding was provided for PWT projects and activities.

**Departmental Support for Integrated Activities**

As per the final administrative guidance, this item consists of support to programs carried out by persons with joint extension and research appointments in academic departments.

Cornell Cooperative Extension provided Smith Lever 3 b and c funds totaling $2,255,349 to support faculty and staff who were responsible for research and extension programs in the Colleges of Agriculture and Life Sciences and Human Ecology and the Geneva Experiment Station. Total faculty supported equaled 40.5 FTEs and Senior Extension and Extension Associates equaled 10.8 FTE. These expenditures are fully documented by department and university financial and human resource records.

**Smith-Lever Integrated Activities Target Percentage Attainment**

The combined support for Research/Extension Integration Grants, Program Work Team Projects and Activities, and Departmental Support for Integrated Activities was $2,374,062 which is 26.7% of our total S-L 3b and 3c funds for FY04 thereby exceeding our target of 25%.

**Hatch Act Integrated Activities and Target Percentage Attainment**

The Cornell University Agricultural Experiment Station and the New York State Agricultural Experiment Station provided Hatch and Hatch-Multistate funds totaling $1,303,028 to support faculty and staff who were responsible for integrated research and extension programs in the Colleges of Agriculture and Life Sciences and Human Ecology and the Geneva Experiment Station. This is 25% of our total 2004 Hatch Act Appropriation, thereby meeting our target of 25%. Total research and extension appointments equaled 74.2 FTEs for faculty who were responsible for integrated research and extension programs in the Colleges of Agriculture and Life Sciences and Human Ecology and the Geneva Experiment Station. These expenditures are fully documented by department and university financial and human resource records.