



Northern Marianas College

CNMI Cooperative Research, Extension and Education Service
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February 28, 2003

Dr. George Cooper, Deputy Administrator, Partnerships
C/O: Barton Hewitt
Partnerships/POW
Cooperative State Research, Education and Extension Service
U.S. Department of Agriculture
800 9th St., SW
Washington, DC 20024

Dear Dr. Cooper:

Please accept the AREERA Plan of Work Annual Report for 2002 for Northern Marianas College Cooperative Research, Extension and Education Service.

We are sending it to you in two separate ways:

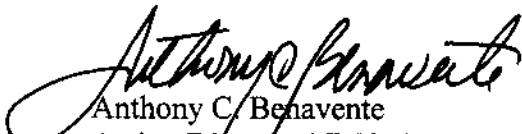
1. The AREERA Annual Report has been uploaded to the NMC-CREES website at this address: <http://crees.org/areera2002>. At this page you can link to the document in two forms: Adobe Acrobat PDF and Microsoft Word.

For the 2001 annual report, Dr. Craig Smith, former Director, informed me that you preferred it as an online document, to ease downloading into your computer.

2. Printed hardcopy of the AREERA Report sent by FedEx to the address above.

Please contact me if there are any problems. Thank you.

Sincerely,


Anthony C. Benavente
Acting Director, NMC-CREES



AREERA POW REPORT

Agriculture Research, Extension and Education Reform Act of 1998

**Annual Report of Accomplishments and Results
FY 2002**

**Northern Marianas College
Cooperative Research, Extension, and Education Service (NMC-CREES)
Commonwealth of the Northern Mariana Islands (CNMI), USA**

Report: FY 2002 AREERA Report for the Northern Mariana Islands. Submitted by the Northern Marianas College Cooperative Research, Extension, and Education Service (NMC-CREES). This report represents the combined Extension and Research programs of Northern Marianas College as presented in the AREERA plan of work submitted in 1999 and subsequently revised in 2000.

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Introduction

The Northern Marianas College-Cooperative Research, Extension and Education Service, (NMC-CREES) provides outreach education and research projects through its two programs of Agriculture Research & Extension (ARE) and Family & Consumer Sciences (FCS). With continuous interaction and a unified direction, both programs are dedicated to helping improve economic well-being, living conditions and overall quality of life within the Commonwealth of the Northern Mariana Islands (CNMI). Our key stakeholders include: farmers, families, youths, individuals, government agencies, and various ethnic communities.

The CNMI is a chain of 14 islands, north of Guam in the Western Pacific. However, Saipan, Tinian and Rota are the main islands in the CNMI. The total land area of the three islands is approximately 118 square miles. The total CNMI population is about 60,000 with an indigenous population of 18,000, consisting of Chamorros and Carolinians. In addition, 86% of the total population speaks a language other than English. The diversity of cultures and languages creates numerous challenges for NMC-CREES. However, our programs are dedicated to serving the needs of our stakeholders

In relation to other land grant institutions, NMC-CREES is small in size, with fewer than forty employees distributed amongst the three major islands. To resolve the shortage of manpower, NMC-CREES relies on key collaborations and partnerships with government agencies, non-profit organizations and other entities throughout the CNMI and the region. Our collaboration enables us to promote our educational programs, extension services and research projects. In exchange, NMC-CREES provides collaborators with the knowledge and expertise to aid their respective organizations or agencies.

Extension services and research projects are the result of the growing needs and challenges that the CNMI community faces. These programs are also in line with the missions of the Cooperative Research, Extension and Education Service and the Northern Marianas College.

NMC-CREES programs from Agriculture Research & Extension (ARE) and Family & Consumer Sciences (FCS) include:

Programs involved in the Agriculture Research & Extension include:

- Aquaculture Development
- Crop Improvement
- Plant Protection
- Soil and Water Management
- Communications
- Soil and Water Quality Program

The Family and Consumer Sciences programs include:

- Food Safety and Quality
- Expanded Food and Nutrition Education Program (EFNEP)
- Nutrition, Diet and Health
- Community Resource Development
- Family Development and Resource Management
 - Parenting program
 - Limited Resource Sewing Program
 - 4H Youth Development
 - Leadership and Volunteer Development

NMC-CREES focuses on the combination and integration of Research and Extension activities. Both researchers and extension agents work hand in hand to deliver a total package of information and resources that address our stakeholders' needs. Funding for many of our programs include Smith-Lever, Hatch Act appropriations and other competitive grants.

A. PLANNED PROGRAM ACCOMPLISHMENT REPORTS

Goal 1: Competitive in the Global Economy

OVERVIEW

Since the inception of NMC-CREES in 1987, it has been a priority to enhance agriculture in the CNMI. Importation of agricultural products continues to thwart the overall improvement and development of the agriculture industry in the CNMI. In addition, the lack of quality, as well as the inconsistent supply of locally grown agricultural produce, continues to dissuade the development of agriculture. Furthermore, terrorism together with unpredictable port conditions has become major factors to the slowed improvement of the CNMI's local agricultural industry. Immediately after the September 11 incident, the CNMI's economy plummeted and has slowly recovered since.

To address these issues, NMC-CREES strengthened collaboration with local agencies to effectively meet the needs of stakeholders using minimal resources. In addition, NMC-CREES has begun focusing on areas that will improve the marketability of agricultural products as well as the introduction of niche crops. Furthermore, NMC-CREES continues to work at improving existing programs through stakeholder input. These in turn will minimize importation, increase exportation and ultimately, stimulate the island's economy.

The NMC-CREES Programs that address Goal 1 are the Crop Improvement Program, Aquaculture Development Program, Plant Protection Program, Plant Nutrition and Soil Management Program and the Sustainable Agriculture Program and the Food Safety and Quality Program.

A. ACTIVITIES

Last year, NMC-CREES focused primarily on improving the agriculture industry by conducting numerous research projects, workshops and presentations targeting the needs of commercial and noncommercial farmers. All activities NMC-CREES Programs conducted complied with the NMC-CREES 5 Year Plan of Work.

The Food Safety and Quality Program conducted a series of workshops on post handling, food processing and food preservation techniques. The purpose of these workshops was to educate farmers and the general community about techniques of increasing the value of produce through processing and by prolonging shelf life. In addition, the Food Safety and Quality Program conducted a workshop on Noni/Lada (*Morina citrifolia*) production, post handling and processing as an alternative crop for farmers. These workshops will allow farmers and community members to compete with imported products.

In addition to workshops that centered on introducing new crops and markets for the community, continued improvements on existing crops and markets were also addressed. In collaboration with several local government agencies, the first Tilapia Cook-Off was held at the Garapan Street Market, in hopes of increasing demand for tilapia at restaurants and hotels. In addition, NMC-CREES hoped to increase the consumption of tilapia by

indigenous and non-resident families and individuals in the CNMI. At least 200 people attended the event.

Other activities include workshops and research projects that focus on maximizing profit from existing crops. The Plant Protection Program focused its efforts on reducing damage caused by invasive species by setting up monitoring stations to better understand the dynamics in pest populations.

In addition, rainy season production of tomatoes in the CNMI has been nonexistent due to the numerous problems associated with excess moisture. More than 90% of farmers do not incorporate raised beds or plastic mulch in their farming practices, resulting in highly saturated fields and poor plant health. To address this issue, the Crop Improvement Program conducted research on the production of tomatoes during rainy season. Using new designs developed by NMC-CREES will allow farmers to continuously grow tomatoes year round.

B. HIGHLIGHTS

Through workshops, training sessions, client visitations, minor publications and newsletters, NMC-CREES successfully reached thousands of clients and individuals throughout the CNMI. These activities were all successfully accomplished with the collaborative efforts of approximately 20 local agencies and organizations.

As part of the Food Safety and Quality Program's efforts to develop a market of processed foods, several recipes have been sent to laboratories for analysis. Recipes submitted have received FDA approval for exportation to the US Mainland.

The Tilapia Cook-Off increased the number of Garapan Street Market goers on the evening of the event, as reported by the Marians Visitors Authority (MVA). MVA claims that they have not seen as many people at the Garapan Street Market at any one given day. Hundreds of people had the opportunity to taste the recipes created by the chefs.

C. IMPACT

The Food Safety and Quality Program trained farmers on adding value to their crops, and to compete with imported commodities. At the same time, it gave farmers an opportunity to export to neighboring islands as well as to the US Mainland. Opening doors to new markets will also improve the overall economic status of the CNMI.

The introduction of the Tilapia Cook-Off has gained interest from hotels and the tourism industry. Aside from promoting the consumption and production of locally grown tilapia, this event has also attracted tourists to the island of Saipan. Tourists interviewed by local newspapers showed interest and mentioned coming back to Saipan to attend the next Tilapia Cook-Off. Other impact includes the support of the Food and Nutrition Council in republishing 1,000 copies of the recipe book.

The Crop Improvement and Plant Protection Programs also significantly impacted stakeholders as farmers began using biological pesticides. Also, with the establishment of monitoring stations, research and extension staff are able to assess the behavior of pests in the CNMI. In addition, the set up of traps has dramatically reduced the number of specific pests in the farms.

D. ASSESSMENT

Despite the high turnover rate of employees last year, NMC-CREES was able to address key themes within Goal 1, and remain in compliance with NMC-CREES 5 Year Plan of Work.

E. FUNDING AND FTE

FTE's: 5	PROGRAM COSTS: \$359,839
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Key Theme- Adding Value to New and Old Agricultural Products

- a. A series of workshops and training sessions were held, focusing on improving food-processing techniques for bananas, taro, breadfruit and sweet potato. Additional workshops were conducted on canning of local fruits and vegetables, and food storage and handling to improve shelf life and transportability. The target audience of the workshop was commercial farmers. However, backyard farmers were also encouraged to participate in the workshop.
- b. Four new producers of jams and chips have opened businesses. One pineapple farmer has expanded farm operations and is now producing jam. Another farmer has opened a small outlet to sell locally produced jams and other locally processed commodities at the airport. Currently 6 products (pineapple jam, guava jam, taro chips, papaya jam, hot pepper sauce and coconut oil) have been FDA approved and are currently being exported to Guam, Hawaii and the U.S Mainland.
- c. Source of Federal Funding: Smith-Lever, USDA National Food Safety Initiative
- d. Scope of Impact: Regional

Key Theme- Niche Market

- a. As a means to introduce a new cash crop, a workshop was held on Rota focusing on the production, post handling and processing of Noni/Lada (*Morina citrifolia*). Noni/Lada is an indigenous plant that is found throughout the CNMI.

- b. A total of 43 participants from the Pacific Region attended the Noni Workshop. Prior to the workshop, there were no producers in the CNMI. As a result, 2 farmers have newly planted 1,000 trees each, on the island of Rota.
- c. Source of Federal Funding: Smith-Lever, USDA National Integrated Food Safety Initiative
- d. Scope of Impact: State Specific

Key Theme- Agricultural Profitability

- a. To offset high costs of importing pesticides, extension and research personnel demonstrated propagation and chemical extraction techniques, to encourage farmers to grow their own pesticides thereby reducing the need for costly commercial pesticides.
- b. By significantly reducing the need for commercial pesticides, farmers save money and increase their profit margin. Due to efforts of research and extension agents, 15 out of 100 commercial farmers in the CNMI have adopted the practice of botanical pesticides.
- c. Source of Federal Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Innovative Farming Techniques

- a. The Crop Improvement Program conducted research to successfully producing tomatoes during rainy season using overhead rain filters, plastic mulching and raised beds.
- b. All tomato varieties tested produced more tomatoes when incorporating raised beds, plastic mulch and rain filters. Studies proved that with the current design, flowers setting on the plant increased by nearly 169%.
- c. Source of Federal Funding: Hatch
- d. Scope of Impact: State Specific

Key Theme- Invasive Species

- a. NMC-CREES Plant Protection Program has established five permanent sites on each of the three islands of Saipan, Tinian and Rota. Each station now is equipped with an available rain gauge, several insect traps, lure and sex pheromone/attractant for several specified species or groups of insect as

follows: Aphids (melon, bean and citrus) and whiteflies, Melon fly, Diamond Back moth, Corn/fruit earworm, Sweet potato weevil (*Cylas formicarius*), Oriental fruit fly (*Bactrocera dorsalis*) and Chafer/scarab beetles. Trap captures are monitored on a weekly basis, targeting three main species: Diamond Back Moth, Corn/fruit Earworm and Sweet Potato Weevil.

- b. Plant Protection Program staff have gained the capacity to detect the incidence and arrival of new pest species (i.e. Oriental fruit fly *B. dorsalis*), which pose a serious threat to the food crops of the Northern Marianas. In addition, a clear picture on the population dynamics of the Melon fly has illustrated the varying effects of weather, climate and catastrophic weather. The immediate impact of this activity is that farmers will be able to program their planting schedules and to assist in the eradication program of the Melon fly.
- c. Source of Federal Funding: Smith-Lever, Hatch
- d. Scope of Impact: State Specific

Key Theme- Aquaculture

- a. The first Tilapia Cook-Off was held as part of the Aquaculture Development Program's effort to increase the number of aquaculture farmers in the CNMI. Participants of the Cook-Off include professional chefs from many hotels on the island of Saipan. Over 200 recipe books were distributed to individuals at the Tilapia Cook-Off.
- b. As a result of the Tilapia Cook-Off, the Food and Nutrition Council, a health advisory board, approved appropriation to republish the recipe book for additional distribution. Furthermore, extension staff noted a significant 30% increase in the number of aquaculture farmers throughout the CNMI.
- c. Source of Federal Funding: Smith-Lever
- d. Scope of Impact: State Specific

Goal 2: A Safe and Secure Food and Fiber System

For 15 years, the NMC-CREES through its Family and Consumer Science and the Agriculture Research and Extension programs has helped CNMI consumers become more informed about food safety and quality issues. The educational programs deliver research-based information and education in the classroom, community group settings, and food and retail establishments to help participants prepare, handle, and store food safely. In addition, extension agents and researchers worked together to promote container gardening in schools and homes. As a result, consumers have access to a wholesome and secure food and fiber supply.

The Family and Consumer Science and Agriculture Research and Extension programs that address Goal 2 are: the Plant Protection Program, the Aquaculture and Fisheries Development Program, Food Safety and Quality Program, the Expanded Food and Nutrition Education Program, and the Nutrition, Diet and Health program.

A. ACTIVITIES

In the past year, FCS and Agriculture extension agents have conducted a series of food processing workshops and food safety learning sessions to prevent food borne illness and improve the quality of foods. Participants included various members of the community such as homemakers, school-aged children, farmers, and food and retail establishment employees to name a few. Also conducted were different workshops and training sessions in the areas of container gardening and pesticide application through formal and non-formal education. Additionally, the CREES official website was created to serve as another form of outreach to the community where educational materials are available.

During the summer, FCS and ARE in collaboration with various government and private organizations, coordinated the summer youth programs. The goal was to promote basic life skills to at-risk youth groups. Subjects taught included food safety, kitchen safety, the food guide pyramid, physical activity, horticulture, aquaculture, and basic sewing and crafts.

Lastly, with the assistance of internal and external partners, research on methods to prolong shelf life of agricultural produce as well as processing and preserving techniques are being conducted.

B. HIGHLIGHTS

Through collaborations with the Division of Environmental Quality, the Nutrition Assistance Program (NAP), the Public School System, the Department of Public Health, and the Department of Lands and Natural Resources, FCS and Agriculture Research and Extension has reached over 3000 families, individuals and youth throughout the CNMI in the last year. More than 200 individuals were reached during the food processing workshops. Additionally, with the help of many volunteers from the community, a video illustrating proper food handling techniques for the home was developed and aired on the public channel of a local cable company. Youth who participated in the summer

programs emerged with an increased knowledge in disease prevention, leadership skills, and modern farming techniques.

Researchers continue to focus on processing and preserving excess and/or damaged produce in order to prevent food wastage. Methods being tested include the use of ethylene gas control system, vacuum pack technology, and edible wax.

C. IMPACT

With the collaboration efforts between FCS, ARE and various internal and external partners, over 3000 families, individuals and youth were reached last year. In addition, other service agencies have increased their clientele numbers because of our collaborative efforts. Evaluation results show that CREES programs are appropriate for their clientele and program needs. Memorandums of Understanding secure the relationship and the collaborative efforts between CREES and its partners. For instance, the Rota Department of Public Health now requires all food handlers and food processors to undergo the CREES food safety training. Participants who completed CREES programs were taught skills to provide a safe and secure food system. They have more knowledge in the areas of food safety and quality, pesticide application, and container gardening of high nutrient-density crops. Ninety percent (90%) of participants who attended the Food Safety in the Childcare Facility training sessions passed and are now aware of food borne illness prevention. As a result of the Food Processing workshops, several farmers are now capable of processing their left over and low quality produce to prevent wastage.

There were about 280 youth and families with young children throughout the CNMI enrolled in EFNEP. According to the EFNEP evaluation report, more than 78% of the graduates demonstrated acceptable food resource management practices such as planning meals, comparing prices, using grocery lists, and not running out of food or cutting children's meals because there was not enough money to prepare them. Meanwhile, 90% of the graduates demonstrated acceptable food safety practices such as thawing or storing food properly. Also, over 85% of youth from the summer programs demonstrated the ability to wash hands properly, to avoid cross-contamination, and to use temperature control when handling food.

D. ASSESSMENT

All Family and Consumer Science and Agriculture Research and Extension activities are in line with the CREES Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. Furthermore, various activities in the Plan of Work had to be placed in a different year because of high staff turnover.

E. FUNDING AND FTE

FTE's: 6	PROGRAM COSTS: \$372,716
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Key Theme – Food Safety

- a. In the last decade, the number of childcare facilities in the CNMI has increased by approximately 150%. In order to be employed in a childcare center, a person must receive a food handler's certificate that can only be attained by completing a workshop conducted by the Bureau of Environmental Health. Unfortunately, the workshop is designed for food service establishment employees and not childcare. Unfortunately, there is no formalized food safety training available for childcare providers. Therefore, CREES developed a training program specifically for childcare providers as well as public school food monitors. The purpose of the training was to educate participants about the basics of food borne illness prevention in the childcare and school food service facility. The main theme of the training was modeled after the *Fight BAC!* educational campaign as well as the curriculum Food Safety for Childcare Providers developed by the University of Guam. There were a total of about 50 participants.
- b. Pretests indicated that participants had very little knowledge of the *Fight BAC!* concept thus resulting in an average of 40% passing rate prior to the training. Upon completion of the training, however, 90% of participants passed the exam that they needed in order to receive a certificate of completion.
- c. Source of Funds: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Food Safety

- a. The safety and quality of our food supply is improved when farmers and commercial pest control operators use, store, and dispose of pesticides in a safe and appropriate manner. Last year, NMC-CREES conducted pesticide applicator training workshops for clients in the CNMI. After passing the course exam, clients are then licensed to purchase and use Restricted Use Pesticides.
- b. Due to the difficulty of the exam, the number of farmers participating and passing the exams has significantly declined. Moreover, according to the local regulatory agency, empty cans of illegal pesticides have been found in dumps. With this revelation, farm workers and consumers are at risk of pesticide residues from the unsafe handling, use, storage and disposal of unknown pesticides.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Food Safety

- a. Workshops were conducted on proper handling of food to prevent from contamination, proper handling of food processing equipment, quality control in the production and processing lines, food borne illness prevention, and risk analysis. In attendance were more than 200 participants consisting of food processors, farmers, retailers, restaurant chefs, and many more.
- b. Prior to the workshop, local food processors had difficulty preserving their food products. However, after completing the workshop, they have learned to use additives, such as citric acid, to prolong the shelf life of foods. Furthermore, farmers have increased their knowledge of maintaining quality agricultural produce used for export.
- c. Source of Funding: USDA National Integrated Food Safety Initiative
- d. Scope of Impact: State Specific

Key Theme – Food Safety

- a. The EFNEP Program enrolled about 280 youth and families with young children. They were taught how to keep food safe using the Food and Money Basics curriculum, developed by University of Hawaii.
- b. According to the program evaluation reports, at entry, 45% of the participants demonstrated acceptable food safety practices. Upon exit, however, 90% showed improvement. As a result, families now practice safe food handling to prevent food borne illness. Furthermore, 90% of the youth participants are practicing proper hand washing techniques.
- c. Source of Funds: Smith-Lever, State-Local matching
- d. Scope of Impact: State Specific

Key Theme – Food Resource Management

- a. The EFNEP Program continuously recruits limited resource families and individuals with young children and conducts learning sessions using the Food and Money Basics curriculum. Clients are taught to make most out of their food dollars by shopping wisely, meal planning, and setting goals.
- b. There were about 151 youth and 129 families or individuals with young children that participated in these learning sessions. According to program evaluation results, 28% of the participants who enrolled in the program demonstrated

acceptable practices of food resource management. At exit, 78% demonstrated acceptable practices. As a result, participants are now able to save money by comparing prices while shopping, using grocery lists, and by planning meals ahead of time. Youth were taught the value of saving money and goal setting.

- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Food Security

- a. Because of unreliable shipping from the US Mainland to the CNMI and excessive importation of food, the 2002 Tilapia Cook-Off was held to promote self-reliance and to promote local consumption to ensure food availability for residence of the CNMI. Participants of the Cook-Off included professional chefs from many hotels on the island of Saipan. Over 200 recipe books were distributed to individuals at the Tilapia Cook-Off.
- b. A total of six chefs from three major hotels participated in the Cook-Off. More than 200 community members attended the Cook-Off, based on the number of recipe books that were distributed. As a result, there was a 30% increase in the number of aquaculture farmers in the CNMI.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Goal 3: A Healthy, Well-Nourished Population

OVERVIEW

The Family and Consumer Science and Agriculture Research and Extension programs that address the health needs of families, individuals and youth in the CNMI are the Expanded Food and Nutrition Education Program (EFNEP), Nutrition, Diet and Health Program, and the Aquaculture Development Program.

Nutrition and Chronic Disease

One of the leading causes of death among the indigenous population (Chamorro and Carolinian) is Type II diabetes and its complications. Nearly one in five are suffering from the disease while another one in five is unaware that they have high blood glucose levels (*source: Department of Public Health*). The most recent studies have indicated that the CNMI has the third highest rates of Type II Diabetes in the world. Thus, diabetes awareness education is imperative in order to address the increasing rates.

According to the American Diabetes Association, the risk factors for Type II Diabetes Mellitus include obesity, high blood pressure, and a sedentary lifestyle. Almost 35% of the population is obese. Moreover, a survey conducted by the CNMI Department of Public Health showed that one out of three school-aged children are diagnosed as either overweight or obese according to BMI. Thus, these children are at risk for developing Type II Diabetes. A survey of over 1500 children (9-11 years old) indicated that their five most frequently consumed foods were high sugar fruit drinks, soda, luncheon meats, spare ribs, and chips. The least frequently eaten foods were locally grown indigenous food. The School Nutrition and Physical Activity Partnership (SNAPP) comprised of NMC-CREES extension agents and other health educators and schoolteachers are working on improving the diets and knowledge of students, especially at the elementary level. Unfortunately, due to recent cutbacks in education, health and physical education is no longer a mandatory part of the curriculum. Therefore, nutrition integration is the only other alternative to educate children about healthy food choices.

Furthermore, since the recent economic downfall in the CNMI, more people are becoming financially insecure and turning to public assistance for help. According to the Nutrition Assistance Program, there has been a drastic increase of participants just in the last year and the numbers keep rising. With more families on the brink of financial relapse, shopping on a budget may make it more difficult to choose highly nutritious foods. Therefore low-income individuals and families with young children (that includes NAP recipients, Head Start parents and children, and Medicaid recipients) need to participate in free food and nutrition education programs such as the Expanded Food and Nutrition Education Program (EFNEP) and container/backyard gardening programs.

A. ACTIVITIES

In the past year, FCS and ARE combined efforts to address the rise in obesity and chronic disease rates among indigenous people. Extension agents in collaboration with other government and private agencies conducted various workshops and training sessions in the areas of nutrition integration in the classroom, promoting the consumption of local

produce and making healthy food choices. The 2002 Tilapia Cook-off served to promote an alternative protein source that can be locally farmed rather than relying on imports. Physical activity, one of the best ways to prevent obesity, was addressed through community health walk projects such as the 'Let's Get Going' and the 'Walk For Life' campaigns. In addition, a nutrition newsletter is circulated to over 1500 food stamp recipients monthly. Additionally, the CREES official website was created to serve as another form of outreach to the community.

During the summer, the 4H program held its annual youth programs in order to encourage continuous learning among at-risk youth. The goal of the Summer Youth Program is to promote basic life skills. Subjects taught by various FCS and Agriculture extension agents were food safety, kitchen safety, the food guide pyramid, physical activity, horticulture, aquaculture, and basic sewing and crafts.

Nutraceuticals continue to represent one of the fastest growing areas of research and development leading to novel products intended for human use. The interest in this field has been tremendous and expanding rapidly as the focal point is disease prevention and health promotion via dietary means. A great deal has been learned, and the advent of inclusion of traditional and alternative medicine as well as over-the-counter (OTC) drugs has created a new momentum for further developments in the Nutraceuticals and natural health product area. Furthermore, ethnic foods and their ingredients have influenced dietary habits in the western world and some have helped in novel advances in functional foods and ingredients from them.

B. HIGHLIGHTS

Through collaborations with the Division of Environmental Quality, the Nutrition Assistance Program (NAP), the Public School System, Head Start Program, the Department of Public Health, and the Department of Lands and Natural Resources, FCS and Agriculture Research and Extension has reached over 3000 families, individuals and youth throughout the CNMI in the last year.

The first annual CNMI Nutrition Month served to educate the entire community about healthy food choices and positive lifestyle changes. In light of the alarming statistics regarding Type II Diabetes, NMC-CREES has made it a priority to address chronic disease prevention among school-aged children and their families. Nutrition education presentations were held in classrooms, Parent-Student-Teacher Association meetings, and other school-based organizations.

Additionally, FCS extension agents conducted workshops to promote the integration of food and nutrition education into the current public school system's curriculums. As a result, participants (mostly public school teachers and administrators) learned ways to include nutrition education into their lesson plans. Due to the success of the workshop, the public school system would like to train more of its teachers on integrating food and nutrition education into current curriculums. Moreover, agents attended various classes at the local high school to teach students kitchen and food safety, ways to include local vegetables into their diets, and budgeting and money management.

Due to a limited number of extension agents, every program is required to share resources and clientele. As a result of the program redirection, CREES program participants developed more knowledge and skills to be productive members of the family and the community. In addition, with the integration of research and extension, FCS extension agents successfully collaborated with researchers to continue the summer youth programs. Youth who participated emerged with an increased knowledge in chronic disease prevention, leadership skills, and modern farming techniques.

Furthermore, health fair organizers continually depend and rely on the support of the FCS and ARE programs because of its active role in the community. Thus, CREES was well represented at the many health symposiums, conferences, and other various events where health and wellness were the main theme.

In addition to extension efforts, researchers are continuing to study the health benefits of various high nutrient density crops grown locally. The focus of the research is on the food ingredients and phytochemical compounds that help to reduce the risk of certain diseases.

C. IMPACT

With the collaboration between FCS, ARE and external partners, over 3000 families, individuals and youth were reached last year. In addition, stakeholders increased their clientele numbers because of our collaborative efforts. Evaluation results from stakeholders show that CREES programs are appropriate for their clientele and program needs. Memorandums of Understanding secure the relationship and the collaborative efforts between CREES and its stakeholders. A case in point, an MOU with the Head Start program was created in order to maximize our resources and to recruit their clients into the NMC-CREES nutrition education program. As a result, we now have the support to promote our health promotion and disease prevention workshops in the villages, making it easier for families to become informed. Furthermore, the MOU states that any costs incurred by the workshops shall be the responsibility of the Head Start program thus proving their commitment to helping limited resource families.

Participants who completed our programs were taught to become more self-reliant and healthy by consuming nutrient-dense local produce and increasing physical activity. They have more knowledge in the areas of basic nutrition, farming and physical activity. According to clientele evaluation results, there was an approximate 70% increase in knowledge and skills of clients in various programs and another 30% increase in behavior change.

Furthermore, the Expanded Food and Nutrition Education Program (EFNEP) enrolled 129 families. According to EFNEP evaluation reports, at entry, none of the participants achieved acceptable scores in nutrition practices. However, in the end, 75% achieved acceptable scores.

D. ASSESSMENT

All FCS and ARE activities are in line with the FCS Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. For instance, with the recent discoveries of the increase rates of Type II Diabetes in children, all programs redirected their focus to address this alarming concern. Furthermore, various activities in the Plan of Work had to be placed in a different year because of staff turnover.

E. FUNDING AND FTE

FTE's: 7.42	PROGRAM COSTS: \$380,625
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Key Theme – Human Nutrition

- a. Various activities emphasizing healthy food choices and the consumption of locally grown high-nutrient dense produce took place in order to promote chronic disease prevention and awareness among children of all ages. Free health and blood glucose screenings and diabetes awareness education presentations were conducted at public schools, PTA meetings, health fairs, and other community events. During the first annual CNMI Nutrition Month in March, public and private schools participated in an essay contest that focused on healthier eating and physical activity. In addition, school children and their families participated in backyard and/or container gardening activities.
- b. Over 500 young children participated in various activities throughout the year. According to post evaluations, 84% increased their knowledge of healthy food choices. During the summer programs for youth, 90% increased their ability to prepare healthy snacks using the local food pyramid as a guide. As a result of the health screenings, it was discovered that many children had high blood glucose levels. This resulted in an aggressive campaign to advocate screening of high school students in the public school system. Partnerships with health agencies were formed to address this serious concern. Finally, according to post evaluation results, an average of 84% of youth increased their knowledge of healthy eating using the food guide pyramid.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Human Nutrition

- a. Through our collaborations with the Department of Public Health, we were able to conduct a variety of diabetes awareness and prevention through means such as free blood glucose screenings, community workshops, health walks, and food demonstrations using locally grown vegetables. Physical activity was emphasized

during the “Let’s Get Going” program and the monthly health walks that involved the entire community.

- b. Over 2500 people participated in various diabetes awareness and education activities. About 5% of participants have shared with us that they stopped purchasing and eating canned luncheon meats due to its high fat content. One participant said, “After seeing your presentation, I went home and threw out all the canned luncheon meats in our cabinet.” Furthermore, pre evaluations show 3% of adults demonstrated acceptable nutrition practices such as making healthy food choices, preparing food without adding salt, and reading the nutrition label. At exit, 33% percent showed improvement.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Human Nutrition

- a. NMC-CREES collaborated with the Public School System to train their teachers to be able to integrate nutrition and physical activity into the curriculum. Furthermore, we have also trained food service staff in the areas of nutrition and food safety. We are on a campaign to promote a school nutrition policy that prohibits non-nutritive snacks on school grounds.
- b. In an effort to promote healthy eating, we continue to train schoolteachers to integrate nutrition education into the curriculum. At one particular elementary school, the Principal celebrates Nutrition Week in order to strengthen the school’s nutrition policy. She realized that awareness and education is the key to disease prevention especially among young children and their families. So far, 20% of public schools enforce a nutrition policy that prohibits candies and high-sugar drinks including cola. Furthermore, we have established a partnership with the Public School System Food and Nutrition Service to conduct annual professional development with the food monitors. This year was the first year of training and topics include basic nutrition, portion sizes for children, and food safety. The posttests showed a 17% increase in knowledge of basic human nutrition.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Human Nutrition

- a. The Tilapia Cook-Off was initiated to promote consumption of tilapia as an alternative source of protein. Participants of the Cook-Off include professional chefs from many hotels on the island of Saipan. Over 200 recipe books were distributed to individuals at the Tilapia Cook-Off.
- b. As a result of the Tilapia Cook-Off the Food and Nutrition Council, a health advisory board, approved appropriation to republish the recipe book for additional distribution. In addition, there was a 30% increase in the number of aquaculture farmers.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme – Nutraceuticals

- a. In our research activity, we are working in collaboration with the University of Guam, the University of Hawaii, Hilo and Rutgers University on medicinal plants that are claimed to have health benefits. There are medicinal plants that claim to cure many diseases such as diabetes, cancer, and Alzheimer's to name a few. The focus of the research is on the food ingredients and phytochemical compounds that help to reduce the risk of these diseases.
- b. Impact
 - Opened up commercial opportunities on processing and marketing of Noni Juice, Callophyllum oil and Tumeric curcumin;
 - Increased industrial development and employment opportunity;
 - Generate revenues and increased export earnings. Callophyllum oil is now exported to Guam;
 - Provide an impetus for farmers and producers to investigate and invest in the Nutraceutical industry;
 - Increased market access at global and regional level;
 - Increased trade competitiveness;
 - Increased the economic base for Rota and CNMI as a whole. This reflects in increase in Gross Domestic Production (GDP) as well as reduction in cash outflow.
- c. Source of Funding: USDA National Integrated Food Safety Initiative
- d. Scope of Impact: State Specific

Goal 4: Greater Harmony Between Agriculture and the Environment

OVERVIEW

Because of limited land area, invasion of harmful insects and weeds, poor animal and plant waste management practices, excessive use of commercial pesticides and fertilizers and the depletion of natural resources, protecting the environment has always been a high priority for NMC-CREES. Steps have been taken to protect the environment by educating extension agents, partner agencies, farmers, families and the community, about the options and practices that are available to protect our natural resources.

A. ACTIVITIES

NMC-CREES activities focused on 5 key themes this year, particularly those aimed at reducing the use of commercial pesticides and fertilizers, and at the same time, promoting organic and non-detrimental forms of pesticides and fertilizers.

Research and extension agents from the Plant Protection Program conducted a number of mini-workshops focused on the propagation plants and the extraction of plant oils. These workshops were made available to farmers as well as the general community. The instructors of the workshop also demonstrated proper use of the organic pesticide. Additional activities of the Plant Protection Program include the establishment of stations to monitor invasive species.

To continuously monitor the condition of groundwater and coastal waters from non-point source pollution, NMC-CREES initiated a project utilizing a proven method used by EPA to accurately monitor for pollution. This project will create a baseline on the concentration of contaminants in the water and at the same time, illustrate and possibly map problem areas in the CNMI.

Agricultural waste is an issue of great importance in the CNMI. Poor management practices of livestock and plant debris are common therefore require immediate attention. NMC-CREES continued its efforts by conducting mini workshops that teach the community different ways of processing, such as composting/mulching, plant debris as well as techniques of managing livestock waste in ways most beneficial for the farmer and the environment.

B. HIGHLIGHTS

As part of the Plant Protection Program's efforts, numerous propagated neem and chinaberry plants were distributed to farmers. More than 100 plants have been distributed to farmers in the CNMI. Additional highlights of the Plant Protection Program include the establishment of 5 monitoring stations, on each of the three major islands, to map population patterns, and to identify new invasive species.

C. IMPACT

Farmers have begun growing biological pesticides on their farms to reduce the use of commercial pesticides. More than 15% of farmers in the CNMI have switched to biological pesticides.

In addition, farmers began building compost bins on their farms as an alternative to excessive fertilizer applications. This will minimize dependence of commercial fertilizers. In addition, by using fish and livestock waste, farmers will further decrease use of commercial fertilizers. Farmers have increased their productivity to include both fish and vegetables.

With the establishment of monitoring stations on the three major islands, research and extension agents will be able to carefully monitor pest activity. These stations will also alert agents of any new invasive species.

D. ASSESSMENT

Overall, NMC-CREES successfully met Goal 4 requirements. However, with the high turnover of key staff, particularly in the Plant Protection Program, the number of activities dropped this year. NMC-CREES is currently waiting for authorization from its Board of Regents, to replace key staff, pending a hiring freeze in the institution due to economic constraints in the local government.

E. FUNDING AND FTE

FTE's: 4	PROGRAM COSTS: \$329,859
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Key Theme- Biological Control

- a. To minimize potential environmental impact, extension and research personnel demonstrated the ability for farmers to grow their own pesticides thereby reducing the need for costly commercial pesticides.
- b. By significantly reducing the need for commercial pesticides, farmers will minimize use of extremely toxic pesticides. Due to efforts of research and extension agents, 15 out of 100 commercial farmers in the CNMI have adopted the practice of botanical pesticides.
- c. Source of Federal Funding: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Water Quality

- a. The Soil and Water Management Program conducted a research, using gametes of indigenous urchins, to determine the “health” of coastal waters. An EPA biomonitoring method, called the sea urchin fertilization toxicity test, was used for this particular project.
- b. The Program successfully established a quality assurance manual that has been approved by the Division of Environmental Quality (DEQ), which is the first step in NMC CREES seeking certification for the Laboratory to test public water supplies for compliance with DEQ and US EPA water quality standards. A full standard operating procedure manual has also been compiled which together with the quality assurance manual may be used as core text books for a environmental laboratory technician course, should NMC wish to offer a certification course in the future. Presently the laboratory is also capable of providing drinking water quality testing for the community upon request
- c. Source of Federal Funds: Hatch, Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Agriculture Waste Management

- a. The Aquaculture Development Program and the Crop Improvement Program initiated a project to effectively manage discharge from an earthen pond raising tilapia. An adjacent pond was constructed to raise taro (*Colocasia esculenta*), swamp cabbage (*Ipomoea aquatica*) and leaf lettuce hydroponically. The purpose of this project is to reduce nutrients in water prior to discharge.
- b. The farmer involved in this project maximized his profits by increasing crop production to include vegetable crops as well. In addition, the nutrient levels in the water were substantially reduced to minimize negative impact in the environment.
- c. Source of Federal Funds: Hatch, Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Agriculture Waste Management

- a. The Crop Improvement Program conducted a composting workshop on the island of Rota.
- b. More than 140 participants attended the workshop. As a result, a farmer has constructed a composting unit. In addition, the Rota Municipal Council procured and installed a larger chipper/shredder at the dumpsite to allow residents to shred plant material for compost and mulch.

- c. Source of Federal Funds: Hatch, Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Biodiversity

- a. To protect the native bio-diversity, NMC-CREES Programs investigated into the commercialization of non-traditional crops and promoted the protection of culturally useful plants for medicines and crafts. Two major workshops were offered in the use of Lada/Noni (*Morinda citrifolia*) and there is an on-going training in the use of Da'ok (*Callophylum inophyllum*). Future plans are in place to explore other local crops for use as essential oils. One major grant for a Regional project involving all the US territories of the Pacific has been requested to collect and protect local medicinal plants. Efforts are being made to promote pasture rotation to control invasive pasture weeds.
- b. Da'ok and Noni are now recognized as viable alternative crops with commercial value. Da'ok is being promoted as a wind-break tree with commercial value. Local coffee is being preserved and multiplied for distribution. Three farmers have begun pasture rotation projects. Results of the Regional Medicinal Plant Project proposal evaluation are awaited.
- c. Source of Federal Funding: Smith-Lever, WSARE
- d. Scope of Impact: State Specific

Key Theme- Integrated Pest Management (Also reported in Goal 1)

- a. NMC-CREES Plant Protection Program has established five permanent sites on each of the three islands of Saipan, Tinian and Rota. Each station now is equipped with an available rain gauge, several insect traps, lure and sex pheromone/attractant for several specified species or groups of insect as follows: Aphids (melon, bean and citrus) and whiteflies, Melon fly, Diamond Back moth, Corn/fruit earworm, Sweet potato weevil (*Cylas formicarius*), Oriental fruit fly (*Bactrocera dorsalis*) and Chafer/scarab beetles. Trap captures are monitored on a weekly basis, targeting three main species: Diamond Back Moth, Corn/fruit Earworm and Sweet Potato Weevil.
- b. Plant Protection Program staff have gained the capacity to detect the incidence and arrival of new pest species (i.e. Oriental fruit fly *B. dorsalis*), which pose a serious threat to the food crops of the Northern Marianas. In addition, a clear picture on the population dynamics of the Melon fly has illustrated the varying effects of weather, climate and catastrophic weather. The immediate impact of this activity is that farmers will be able to program their planting schedules and to assist in the eradication program of the Melon fly.

- c. Source of Federal Funds: Hatch, Smith-Lever
- d. Scope of Impact: State Specific

Theme- Integrated Pest Management

- a. During past years and the present time the CNMI farmers' have encountered difficulties with the following pests 1) *Bactrocera curcurbatitae* (melon fly), 2) *Cylas formicarius* (Sweet potato weevil), 3) *Plutella xylostella* (Diamond back moth) and a 4) *Bemisia tabaci* (Silver leaf white fly) in the CNMI. A method has been developed to reduce these pests to the minimum level. Traps were set up in five permanent sites at different farm areas on the three islands, Rota, Tinian, and Saipan to control these pests. Also, at the present time CNMI has a problem with intervention of the invasive species called *Cocoonia grandis*, (Scarlet gourd) which the alternative hosts for melon fly. The program has expanded the trapping technique called the mass trapping. However, more melon flies traps are placed in the farm area on Saipan. Therefore, the Agriculture research and Extension Agent goes out in the field on a weekly basis to check on these traps, and also collect data.
- b. During the time that these traps were set in place, there are a large number of insects collected and recorded. But as the research continued on, the numbers of insect collected in these traps were dropped because of the outstanding of the mass trapping technique. There are number of farmers that are interested on these trapping technique so more traps were placed in their farm areas as well. But it as to be a long term research so CREES could get the good impact.
- c. Source of Federal Funds: Hatch, Smith-Lever
- d. Scope of Impact: State Specific

Theme- Yard/Waste Composting

- a. Considerable organic waste has been produced this past year as a result of the 3 typhoons that hit the Northern Marianas. Previously all waste was deposited at the dump/landfill site. On Rota and Tinian, chipper/ shredders have been purchased in an effort to dispose of this heavy supply. One composting demonstration has been conducted in collaboration with the Luta Soil and Water Conservation District. The shredded material from this latest typhoon is being promoted for mulch material for farmers and ornamental horticulturists. Composting demonstration sites have been built at the Rota and Tinian NMC-CREES sites. Although, the Rota demonstration site was destroyed by the latest typhoon. Composting and Mulching techniques have been demonstrated by agents and collaborators for their use in protecting/encouraging the vitality of young trees, as part of the Northern Marianas beautification project.

- b. Two farmers are collecting shredded material from the council to use as mulch. One farmer is composting materials for spreading on his land. Two farmers using the dry litter waste management systems for their piggeries have also composting there pig waste/chips to be used on their crops. Most people are still delivering their yard/organic waste to the dump. There has been a strong increase of community members interested in learning more about composting. More and more community members are encouraging the Department of Land and Natural Resources, who are in control of the chipper/shredders to provide Wood chips on a regular basis to be made available to the public.
- c. Source of Federal Funding: Smith-Lever, Local funding sources
- d. Scope of impact: State Specific

Goal 5: Enhanced Economic Opportunity and Quality of Life

OVERVIEW

The Northern Marianas College CREES programs have worked hard to empower CNMI youths, families, and limited resource individuals in order to address the economic and social challenges they face. The educational programs deliver research-based information and education in the home, classroom, farms and community group settings. The results are well informed, economically prepared individuals who use the skills, tools and newly learned knowledge to improve their overall quality of life and seek economic opportunities.

The Family and Consumer Science and Agriculture Research and Extension programs that address the health needs of families, individuals and youth in the CNMI are the 4H Youth Development Program, Aquaculture Development Program, Family Development and Resource Management Program, and Farm Safety Programs.

A. ACTIVITIES

In the past year, FCS and Agriculture extension agents have worked collaboratively to address the economic and social needs of the community. A variety of different workshops and training sessions in the areas of farm safety, farm management, parenting, youth development, and business marketing were conducted. News releases and the traditional word of mouth approach on economic programs, practices, workshops and training were used to attract interested individuals and the general public. Additionally, the NMC-CREES official web site was created to serve as another form of outreach to the community.

Collaborations with external partners helped to maximize our resources to achieve the common goal. Consequently, families at risk were provided an opportunity to learn effective parenting techniques as well as communication skills. Local farmers and food processors attended many training sessions on ways to prolong the shelf life of their products as well as marketing strategies. Youth at risk took part in summer programs that focused on enhancing life skills and preparing them for adulthood.

Furthermore, community development and business promotion activities were conducted to maximizing the use of locally grown crops. For instance, local fruits are now sold as jams, chips, cookies, etc. This results in an increased demand of agricultural products, thus having a positive influence on the economy.

B. HIGHLIGHTS

Through collaborations, CREES programs reached over 7000 families, individuals and youth throughout the CNMI. Opportunities in the food processing industry are growing rapidly causing the local government to financially assist program activities. In addition, studies have shown that low-income youth who have nothing to do have a higher risk of getting involved in inappropriate behaviors. With this in mind, the summer youth programs were offered to over 100 youth providing a more secure and productive environment during the summer break.

Additionally, about 200 families attended various workshops that focused on topics that help improve family relationships and well being. Topics included positive discipline, communication skills, health and wellness, and much more. Due to the success of the workshops, a local non-profit agency has agreed to fund the workshops annually.

C. IMPACT

As a result of the activities, participants of the various workshops and training sessions have the capability and knowledge to improve their overall well being. Farmers and other food processors have the skill to prolong the shelf life of their products making it suitable for export. Since last year, there has been a significant increase in the number of farmers exporting their products. We predict another increase this coming year due to the community’s demand for more training.

Youth participants of the summer program have learned many skills to help them become productive members of society. For example, 75% of participants have received First Aid/CPR certification. In addition, many are aware of hazards on the farm and are capable of dealing with emergencies.

Participants who completed the various NMC-CREES programs are now more financially and economically aware individuals with the skills to be a productive member of the family and society.

D. ASSESSMENT

All FCS and ARE activities are in line with the NMC-CREES Plan of Work. Various activities in the Plan of Work had to be placed in a different year because of staff turnover. Impacts and results for recently approved programs will be reported next fiscal year.

E. FUNDING AND FTE

FTE’s: 10.58	PROGRAM COSTS: \$409,526
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Key Theme- Youth Development /4-H

- a. The Farm Safety Program began working closely with the 4-H Program on the island of Rota by conducting workshops on 3 occasions based on First Aid and Potential Hazards on Farms. The 3 workshops consisted of campouts, in classroom exercises, presentations, and farm visits. A total of 75 students ranging from ages 8-13 took part in learning more about the hazards associated with farming.
- b. Because 4-H puts focus on hands on learning, the impact associated with their participation in this workshop can be said as being, 75 youth on Rota are able to

provide basic First Aid. The other impact attributed from these workshops is the promotion of the Farm Safety Program to a younger clientele.

- c. Source of Federal Funds: Smith-Lever
- d. Scope of Impact: Island of Rota.

Key Theme- Youth Development /4-H

- a. This past year the Summer Youth Program provided youth a way to keep busy during summer vacation. Not only does this program provide youth with “something to do” it served as the perfect media to bring out NMC-CREES Programs to a younger audience. The youths were exposed to the following NMC-CREES programs: Crop Improvement, Aquaculture, Craft making, EFNEP, Food Processing and Safety, Sewing basics, Money Management, and Nutrition. In addition, the Summer Youth Program served as a great media for exterior collaboration with other government agencies and other non-profit organizations. 4-H Program staff was able to work with organizations such as Department of Lands and Natural Resources, Division of Youth Services, Karidat Inc., Rota and Tinian Mayor’s Offices.
- b. The 200 plus youths who participated over the past summer learned and demonstrated their newly acquired skills by completing projects, handicrafts, nutrition, money management, food preparation and farm safety as well as gardening. In addition, the youth took part in giving back to the community by doing community services such as painting badly vandalized public restrooms.
- c. Source of Funds: Smith-Lever, State, and Private Contributions
- d. Scope of Impact: State Specific

Key Theme- Youth Development /4-H

- a. From our previous assessments and short surveys of youth food intake on Tinian, the program conducted a “Healthy Snacks” workshop at Tinian Elementary and Tinian High School drawing in a crowd of 300 students ranging from grades 1 through 9th. For each grade level the 4-H Program conducted two workshops, which totaled 18 classrooms.
- b. The level of impact in these series of workshops can be stated as 300 students now have a better understanding of the food pyramid. Not only are they able to understand it, they know what types of snacks are healthy for them. Because of the impact we had in the classroom the various school administrators have request

for ongoing workshops and classes to be conducted regularly this School Year beginning February 2003.

- c. Source of Federal Funds: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Promoting Business Programs

- a. Various workshops were held with local food processors to educate them about alternatives techniques to preserving and marketing their products. Processors learned to prolong the shelf life of their products by using preservatives such as Citric acid and Sodium Benzoate.
- b. We have been quite successful in assisting and developing commercial opportunities for the CNMI by acquiring FDA approval on most processed foods. A local business located in the airport has successfully established a link with the tourism industry selling a variety of locally grown processed foods including jams, chips, pickles, oils, honey, and other local traditional snacks. These products are also being exported to other countries. A local farmer is now exporting fresh vegetables to neighboring islands with no spoilage or moisture loss problems. We have been able to control the ripening and decaying, the undesirable metabolic changes and respiratory heat production, and spoilage due to invasion of bacteria, fungi, and yeasts. Overall, we have helped the community in generating income ranging from \$8,000 to \$15,000 a month depending on seasonal production.
- c. Source of Funding: USDA National Integrated Food Safety Initiative
- d. Scope of Impact: State Specific

Key Theme – Farm Safety

- a. Farm Safety has never been considered as an issue on Rota. No statistics are kept by any agency of accidents or incidents that directly relate to farms. Efforts to date have been with youth through the 4H programs and with staff at Department of Lands and Natural Resources. A program was offered to alien farm workers for training in First Aid and CPR provided by local Red Cross trainers because these workers tend to work in remote locations without direct communications. Efforts to train farmers in Farm Safety have focused on Pesticide Safety and Storage of Pesticides through the Pesticide Applicator Training programs.
- b. Approximately 75 youths were trained in Safety Awareness through Youth Camps organized by 4H program. Eight participants including 5 alien workers received First Aid/ CPR certification through Red Cross training. Marianas

Visitors Bureau has placed Slow Moving Vehicle Signs on their equipment. DLNR has been provided with SMV signs.

- c. Source of Federal Funds: Smith-Lever
- d. Scope of impact: State Specific

Key Theme- Children, Youth and Families at Risk

- a. Collaborating with agencies that serve parents and teachers, the Family Development and Resource Management Program conducted a series of Family Education Mini-Workshops. The workshops were conducted twice each month for 8 months in order to increase accessibility of public education targeted at parents and teachers. The participants attended topics on Suicide, Domestic Violence and Child Abuse, Money Management, Couple Communication, Nutrition, Discipline and Legal Concerns.
- b. Each participant gained knowledge on the various topics. Since the composition of the audience varied from each workshop, overall impact assessment is not simple. However, based on follow up calls with a fraction of the participants, individuals are actively involved in the newly created Suicide Task Force, utilize money management strategies, have enrolled in the Common Sense Parenting program, exercise communication skills with their spouse/partner and have drafted living wills.
- c. Source of Funds: Smith-Lever
- d. Scope of Impact: State Specific

Key Theme- Parenting

- a. Collaborating with agencies that serve parents and teachers, the Family Development and Resource Management Program conducted half-day workshops on dental care, discipline, nutrition, and language development on the islands of Saipan, Rota and Tinian. The target population was parents enrolled in the Head Start Program.
- b. Each workshop was well attended by Head Start parents who are now reading with their child more, utilizing the 5 steps of positive discipline, properly brushing their child's teeth and making healthy snacks for the family due to the interactive and hands-on activities that were presented. Further, based on requests from the participants, village workshops are conducted at the head start village centers on Saipan as a follow up to the workshop topics.

- c. Source of Funds: Smith-Lever and other local sources
- d. Scope of Impact: State Specific

B. STAKEHOLDER INPUT PROCESS

NMC-CREES continues to utilize forums, conferences and periodic meetings, with stakeholders, to solicit advice and discuss ARE and FCS needs and priorities. Periodic meetings attended by NMC-CREES staff include: the monthly Tinian Soil and Water Conservation District; Saipan and Northern Islands Soil and Water Conservation; Luta (Rota) Soil and Water Conservation District; the CNMI Interagency Watershed Committee; the Food and Nutrition Council; the Head Start Health Advisory Council; the Rota Agricultural Advisory Council; Parent-Teacher Association and other school-based organizations; and the Women's Affairs Group. Other less regularly held meetings attended, which provide inputs from stakeholders on research and extension needs, include the General Farmers' Meetings, the Farmers' Association Meetings, the Sabalu Market Association and the Saipan Agriculture Fair Association quarterly meeting.

NMC-CREES is committed in improving the stakeholder input process by initiating plans to hold an NMC-CREES Retreat, inviting stakeholders to participate in focus groups and other activities that will effectively involve stakeholders in directing the next 5 Year POW.

C. PROGRAM REVIEW PROCESS

NMC-CREES continues to hold formal Merit/Peer reviews of each federally funded research and extension project proposal, prior to submission. All professional level staff members from NMC-CREES are encouraged to participate in Merit or Peer reviews. Stakeholders are encouraged to also participate in the reviews.

The review process is carried out in three steps: First, a draft of the proposal is e-mailed to all of the NMC-CREES staff and other participants for review, suggestions and comments, well before the peer review meeting. Secondly, the draft of the proposal is revised, based on the comments and suggestions received. Lastly, the revised proposal is submitted to the Director for final review before submittal.

During the review we assess:

- 1) The priority or importance of the proposed project
- 2) The review of literature
- 3) The completeness of the proposal
- 4) The relevance of the proposal
- 5) The quality and scientific value of the proposed research or extension activities and
- 6) The opportunities for cooperation with others.

The proposals are revised to incorporate the suggestions given and agreed upon during the merit/peer review meeting. The Director assures that the agreed upon suggestions are made. The proposal is then submitted to the President of the Northern Marianas College for concurrence. After the concurrence of the President is received, the proposal is then submitted to the appropriate funding agency.