



SHARING UNITED STATES TECHNOLOGY TO AID IN THE IMPROVEMENT OF NUTRITION

## **FINAL REPORT**

### **COOPERATIVE AGREEMENT DAN-A-00-91-00066-00**

(Life of Project: FY 1992 to FY 2000)

This final report describes activities undertaken by the Food Technology and Enterprise – SUSTAIN Project under Cooperative Agreement DAN-A-00-91-00066-00. Activities described in this report were undertaken through the Cooperative Agreement between PATH and USAID Global Programs, Field Support and Research Bureau, Center for Population Health and Nutrition, Office of Health and Nutrition

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# COOPERATIVE AGREEMENT DAN-A-00-91-00066-00

## FINAL REPORT

### I. GOAL OF PROJECT SUSTAIN

Project SUSTAIN's stated goal was "...to improve the nutritional well-being of the populations of selected developing countries, especially, at-risk women and children, by ensuring that there is better quality, safer, and more nutritious foods available at reasonable prices".

### II. BACKGROUND OF PROJECT SUSTAIN

The Sharing U.S. Technology to Aid in the Improvement of Nutrition (SUSTAIN) Project was initiated in 1982. The original goal of the project was to enhance the quality and availability of foods in developing countries by helping to up-grade food processing operations through the transfer of technical know-how and expertise from the U.S. food industry. On September 30, 1991, USAID issued a five-year Cooperative Agreement (CA) to extend and expand support for the SUSTAIN Project. The project was designed to function as a short-term, targeted technical assistance arm of a larger project initiative known as the Food Technology and Enterprise Project. However, the longer-term components of this Food Technology initiative were never funded; the SUSTAIN Project was the only activity funded under this project through USAID Project No. 936-5120. It has been managed by USAID's Bureau for Global Programs, Field Support, and Research/Office of Health and Nutrition (G/PHN/HN).

The goal of the SUSTAIN Project was to be achieved during a five-year period (Fiscal Years' 1992-1996) through a series of *Overseas Activities* (assessment missions, technical consultations, and training workshops) and *Publications* (*SUSTAIN Notes*, activity reports upon completion of overseas activities, and progress reports). Due to the short-term nature of the Project's technical assistance and reliance on volunteers, USAID acknowledged that Project SUSTAIN alone could not be expected to achieve long-term impacts.

The 1996 evaluation of Project SUSTAIN reported that the Project "met or exceeded all of the objectives outlined in the Cooperative Agreement", and "successfully provided access for many small-and medium-scale food processing companies in developing countries to U.S. industry experience and expertise". However, the evaluators noted that the short-term nature of the technical assistance provided by Project SUSTAIN did not lend itself to long-term impacts on the nutritional status of women and children. The long-term impacts were supposed to have been achieved through the larger Food Technology and Enterprise Project. But as mentioned above, the longer-term components of this project were never funded. In lieu of this situation, the evaluators recommended that Project SUSTAIN pursue its efforts to develop long-term programs in a few selected countries and regions, especially in Central America. In line with this

recommendation and USAID's changing priorities toward results-oriented programs, SUSTAIN initiated longer-term initiatives. To this end, G/PHN/HN revised and extended the Cooperative Agreement two additional years. The Cooperative Agreement was later modified twice to provide incremental funding and extend the estimated completion date of the agreement to September 30, 2000.

### **III. ACCOMPLISHMENTS**

#### **A. SHORT-TERM ACTIVITIES**

##### **Background**

As stipulated in the Cooperative Agreement awarded in fiscal year 1992, Project SUSTAIN was to achieve its objectives through "*Overseas Activities*" (assessment visits, technical consultations, and training workshops) and "*Publications*". In addition, Project SUSTAIN would respond to written requests for technical information from persons in less developed countries. While the focus changed to more long-term activities after the 1996 extension to the Cooperative Agreement, SUSTAIN continued to respond to short-term requests for technical assistance from USAID/Washington, USAID Missions, and other organizations until the end of the Cooperative Agreement in September 2000.

##### **Overseas Activities**

A description of short-term activities, professional meetings and symposia conducted by Project SUSTAIN can be found in Appendix A. Many of these activities respond to USAID/PHN's strategic objectives (SO) # 2 and # 3 by increasing the number of appropriate and cost-effective nutrition interventions and approaches (IR2.1 & IR3.1) for populations vulnerable to malnutrition, as well as improved capabilities of individuals, families and communities to protect and enhance maternal nutrition (IR2.3). This is achieved by assisting countries to improve the quality, safety, availability, and affordability of, and markets for, locally produced food products. Activities carried out in Latin America and the Caribbean have contributed to USAID/LAC's strategic objectives by assisting countries' food industries to strengthen fortification of staple foods in the context of new global trade agreements.

##### **Publications**

A list of SUSTAIN publications can be found in Appendix B. Copies of these publications have been distributed to G/PHN and PPC/CDIE.

#### **B. LONG-TERM ACTIVITIES**

Subsequent to the extension of the Cooperative Agreement in 1996, Project SUSTAIN initiated longer-term activities through additional support from core and OYB transfers from the geographic Bureaus (Latin American & Caribbean and Africa) and the Bureau for Humanitarian Response (BHR). Results from the long-term programs follow.

## **1. AFRICAN MICRONUTRIENT/SMALL ENTERPRISE ACTIVITY (AMSEA)**

### **Background**

The African Micronutrient/Small Enterprise Activity (AMSEA) is an activity supported jointly through funding from USAID/AFR and USAID/PHN, which focused on the dual objective of reducing micronutrient malnutrition and strengthening small and medium businesses. These objectives were achieved through the transfer of skills to local counterparts on micronutrient fortification, marketing, processing and distribution of fortified foods as well as post-harvest food processing of crops naturally rich in micronutrients. In collaboration with USAID/AFR and USAID/PHN, SUSTAIN identified Malawi and Ghana as two potential AMSEA sites. AMSEA activities contributed to the achievement of USAID/AFR-SD's strategic objective #3 through the development of appropriate, simple technology to increase household income and/or access to micronutrient-rich foods.

### **Activities**

#### **Malawi**

A SUSTAIN team of two industry volunteers (a food technologist and a marketing specialist) and a small business enterprise development specialist visited Malawi to assist bakeries and manufacturers of likuni phala, a local weaning food, to expand the development and commercialization of fortified food products. Activities included:

- a) Conducting a seminar with representatives from local bakeries on micronutrient fortification in the bakery industry;
- b) Conducting workshops on marketing of micronutrient fortified Likuni Phala and other foods;
- c) Providing technical assistance to World Vision International's Domasi Likuni Phala Production Unit on effective operational methods; and
- d) Providing technical support on the fortification of maize flour at the village level.

The objective of the seminars/workshops was to help increase the market channels for fortified products through strengthened local capacity in food fortification, product quality and packaging skills, and marketing techniques. The results of a survey conducted five months after the workshops were held with the Likuni Phala Production Units indicated that over fifty percent of the respondents experienced a 20 to 40 percent increase in profits. These respondents also reported sharing information gleaned in the workshops with nearly 400 people. The Malawi activity illustrates that by employing creative marketing and distribution techniques and strategies, consumer access to low-cost nutrient rich foods can be significantly expanded. It also clearly demonstrates the benefit of employing industry and business development experts to assist local counterparts to expand the development and commercialization of fortified foods.

## **Ghana**

USAID/Accra invited SUSTAIN to work with ADRA/Ghana to develop post-harvest processing activities that would help to address seasonal gluts of crops as well as generate income for local farmers. Interviews with ADRA staff and farmers in the citrus-growing region of Kadé and farmers of multiple crops in Brong Ahafo revealed that tomatoes, cassava, and oranges are the three crops that farmers rely on most for income generation. Based on these discussions and priorities within USAID's Africa Bureau it was decided to provide technical assistance on the processing of tomatoes, which are naturally rich in vitamin C and provitamin A compounds.

Through SUSTAIN, the Natural Resource Institute (NRI) was engaged to build ADRA's capacity to transfer a low-cost tomato processing technology to their client farmers in the Brong Ahafo region. This technical support enabled ADRA to build a pilot processing plant in Tuobodom, a small village in the Brong Ahafo region selected for its reliable sources of water and power, community dynamics, high production and demand for alternative markets. The pilot plant will process tomato paste from local farmer's tomatoes. This tomato paste will be sold to schools and other institutions in the area. Procedural manuals were drafted and plant staff were trained on operations, maintenance, record keeping, accounting, monitoring and food safety. The first test-run of the tomato paste was completed in September. In addition to increasing income-generating activities in the region, the post-harvest activity will also help to expand the supply and year-round availability of an important vitamin-rich food product in the region.

CSIR, a USAID-funded organization, will carry on follow-up activities in Ghana after September 31, 2000. SUSTAIN worked closely with CSIR to ensure a seamless transition of support.

## **2. CENTRAL AMERICAN REGIONAL MICRONUTRIENT INITIATIVE (CARMI)**

### **Background**

The Central American Regional Micronutrient Initiative (CARMI) is an activity supported jointly through funding from USAID/LAC and USAID/PHN, which focused on reducing micronutrient deficiencies, particularly iron, in Central America. To this end, SUSTAIN worked collaboratively with three other cooperating agencies to design a coordinated strategy for advancing wheat flour fortification in the region. As part of this activity, SUSTAIN visited flour mills in El Salvador, Guatemala, Honduras, Nicaragua to assess current iron fortification practices and the capacity of the mills to produce fortified products according to specifications. In addition, SUSTAIN gathered feedback on fortification needs from PHN officers during a USAID Central America PHN Conference. The results of the assessment revealed the need to strengthen wheat millers' skills in quality assurance.

Recognizing that the consumption of wheat flour is still limited in much of Latin America, SUSTAIN also explored the feasibility of fortifying widely consumed corn-based products. The recent development of commercially produced corn masa flour, coupled with its increasing popularity in Mexico and Central America, provided an ideal vehicle for fortification. SUSTAIN visited a manufacturing plant making corn masa flour (CMF) in Central America and observed the newly industrialized process for making corn nixtamal, which is then dried, ground into corn masa flour, and sold for making tortillas. SUSTAIN initiated contact with the corporate offices of the plants, most of which are located in Mexico, and promoted the opportunity for fortifying the flour. With representation from industry, government and the research community, SUSTAIN established a technical advisory panel and provided technical assistance to help identify appropriate iron fortificants to optimize bioavailability, cost-effectiveness, and consumer acceptance of the fortified product. Technical assistance and lessons learned were later shared with industry and government counterparts in Brazil. These activities were initiated with support from USAID/LAC and USAID/PHN, and later expanded with support from a private foundation.

Results from these activities contributed to USAID/LAC Bureau's strategic objectives by assisting Latin American enterprises in preparing themselves to compete in the new "globalized" trading environment. Advancing food fortification in the Latin American region helps to achieve USAID/PHN's objectives of increased use of nutritious foods in maternal and child health and nutrition interventions.

### **Activities**

#### **1. Technical Assistance to Central American Millers**

Wheat mills in Guatemala, Nicaragua, Honduras, and El Salvador were visited to assess milling and fortification practices and technical assistance needs. Subsequent to the assessment visit, a workshop on quality control and assurance in milling and fortification was conducted in El Salvador for millers from Central America. This workshop was tailored specifically to the needs of the Central American millers and resulted in increased knowledge of micronutrient concerns in the region and improved fortification practices.

#### **2. Convocation of the Corn Masa Advisory Panel**

An advisory panel on corn masa flour was convened to consider a strategy for the iron fortification of corn masa flour in Central America. Panelists identified the need to identify the most appropriate form of iron that could be used to fortify corn masa flour as the physical and chemical interactions between corn masa flour and various iron compounds are largely unknown. Research on the sensory and bioavailability aspects of several iron fortificants was recommended.

#### **3. Identification of Appropriate Fortificants for Corn Masa Flour**

A three-part study (storage, sensory difference, and bioavailability) was conducted to help identify an appropriate iron fortificant for use in fortifying corn masa flour. Results of this study indicated that sodium iron EDTA (NaFeEDTA) and ferrous

fumarate were promising iron fortificants for corn masa flour given their bioavailability results. However, elemental iron performed better than fumarate and iron EDTA during sensory testing. Findings from this research were presented at two leading international conferences for food technologists and nutritionists.

**4. Support to Mexico's Private-Public Partnership**

SUSTAIN provided technical support to the Mexican government/industry partnership to initiate an enrichment program for corn masa flour and wheat flour. This technical support consisted of providing U.S. industry guidance to the Mexican government and industry to help ensure that the iron premix offers an optimal nutritional benefit to consumers without compromising physical properties of the product. The assistance in Mexico was designed to complement and expand the work in Central America since the headquarters for most companies producing corn masa flour were based in Mexico.

**5. Assessment of the Utility of Elemental Iron**

On September 25-26, 2000, SUSTAIN convened a group of leading research scientists and industry professionals in Monterrey Mexico to address the variable and conflicting results from nearly 50 years of research on the bioavailability of elemental iron powders. Elemental iron powders are the most commonly used fortificant in cereal enrichment programs worldwide. But past studies have reported a wide range of relative bioavailability values for these powders – from a low of 5% to a high of 145%. This variability raises questions about the usefulness of these powders in reducing iron deficiency anemia. The Monterrey workshop was organized to help resolve these concerns.

During the course of the workshop, it became apparent that there was significant confusion about the precise type of iron powder used in past studies and in current enrichment programs. In some cases, fortification companies failed to correctly identify iron powders supplied. In other cases, researchers failed to supply complete and accurate information on iron powders used in research, thus making it difficult to draw conclusions from some studies. Nevertheless, based on a review of available data, workshop participants concluded that certain powders should not be recommended for use in fortification programs, while others had merit, but should be studied more thoroughly. Further, scientists and industry agreed on the need to work together to identify the most appropriate of these powders for use in fortification programs. SUSTAIN later convened several briefings for industry, government, USAID and other international agencies to share information on the findings and recommendations from this workshop. Funding for the implementation of these activities was leveraged with a grant from the Bill & Melinda Gates Foundation.

**6. Sharing of Recommendations for Corn Masa Fortification Programs**

In conjunction with the Monterrey workshop, SUSTAIN also convened a meeting with the research scientists and representatives from Central American and Mexican governments and food industry to exchange information on research conducted to-date on corn masa flour. Discussions were held on the results of the workshop and

these results might be applied to the enrichment of corn masa flour. Participants agreed that more information on the bioavailability of elemental iron was needed. In terms of bioavailability, ferrous fumarate and iron-EDTA appeared to be the most effective fortificants. In terms of sensory and cost considerations, elemental iron was the most attractive. Funding for this meeting was also leveraged with support from the Bill & Melinda Gates Foundation.

#### **7. Support to Brazil's Public-Private Partnership**

Most recently Brazil developed a private-public partnership to address micronutrient deficiencies, which was modeled after the Mexican government-industry agreement. Due to SUSTAIN's experience in Mexico on the fortification of corn masa flour, the Brazilian Agricultural Research Corporation (Embrapa), a Ministry of Agriculture institution helping to support the milling industry to voluntarily fortify corn and wheat flour products, requested SUSTAIN's technical assistance. In this context, SUSTAIN assisted Embrapa to assess current fortification capabilities of millers and determine training needs for a mobilization workshop. Subsequent to the assessment visit, SUSTAIN supported experts from the food industry to speak to millers on fortification techniques and present examples of case studies and lessons learned from other countries where fortification programs have been successfully adopted. In an effort to strengthen Embrapa's technical capabilities in fortification technology and quality assurance, SUSTAIN later arranged a tour of U.S. mills and quality control facilities for two Embrapa staff members (November 2000).

### **3. ENHANCING NUTRIENT QUALITIES OF PL 480, TITLE II COMMODITIES**

#### **Background**

With funding provided from USAID/BHR and USAID/PHN, SUSTAIN carried out a number of activities designed to enhance the delivery of essential nutrients and micronutrients in PL 480 Title II food aid commodities to recipients. These activities stemmed, in part, from USAID's efforts to address Congressional directives for increasing micronutrient levels in PL 480 commodities. Preliminary evidence had indicated possible problems with the stability of some micronutrients in the commodities, thus compromising the delivery of essential nutrients to food aid recipients.

To address these concerns, SUSTAIN implemented the following activities in conjunction with USAID/BHR and USAID/PHN: the Vitamin C and Micronutrient Assessment Project (MAP) studies, the Vitamin A in Vegoil Review, the International Food Aid Commodities Secretariat, and a comprehensive update and revision to the Commodity Reference Guide. Fieldwork for the MAP study was carried out under a separate cooperative agreement with USAID/BHR; publication of the final MAP report was performed under this agreement.

Activities to enhance the nutrient quality of PL 480 Title II food aid commodities assisted BHR's Office of Food for Peace to achieve its strategic objectives of (1) critical food needs of targeted groups met (through maintaining or improving the nutritional status of

beneficiaries) and (2) increased effectiveness of FFP's partners in carrying out Title II development activities with measurable results related to food security and primary focus on household nutrition and agricultural productivity.

### **Activities:**

#### **1. The Vitamin C Pilot Activity**

This study explored the advisability and cost-effectiveness of scaling up vitamin C fortification of food aid commodities. The study was initiated in response to a Congressional directive to more than double the vitamin C fortification in blended Title II food aid commodities (corn-soy blend and wheat-soy blend). As part of the activity, SUSTAIN established a technical advisory committee composed of representatives from USAID, USDA, FDA, WFP, and the PL 480 commodity manufacturers. The SUSTAIN study protocol was reviewed and endorsed by the National Academy of Sciences (NAS).

Findings from the Vitamin C Pilot Activity indicated the current amount of vitamin C in the blended foods was surprisingly staple and sufficient for the needs of the recipients and, therefore, no increase in the amount of vitamin C was needed. Study results were supported by NAS and resulted in their confirming the recommendation not to double vitamin C fortification in Title II blended food commodities and that such action would not be cost-effective. As a result, USAID avoided a costly directive from Congress to double the amount of vitamin C added to these commodities. This saved USAID approximately two million dollars each year, enabling the Agency to provide food to hundreds of thousands of additional recipients with these savings.

#### **2. The Micronutrient Assessment Project (MAP) Report**

This two-year study investigated the stability (from production to consumption) and uniformity in the manufacturing process of key micronutrients added to processed fortified Title II food aid commodities. The study was designed to expand beyond the work conducted in the Vitamin C Pilot activity to include fortified processed commodities, (in addition to blended foods), with particular emphasis on vitamin A and iron, given the importance of these micronutrients in the diet. Fieldwork for the MAP study was conducted under a companion cooperative agreement with USAID/BHR and was carried out in close collaboration with USAID/PHN. The final report of the MAP study was published and distributed under this agreement.

Findings from the study revealed shortcomings in the fortification of some PL 480 processed and blended cereals, particularly in the levels of vitamin A. Testing at the manufacturing plants revealed two key problems: (1) low levels of micronutrients in the commodities (due perhaps to low addition rates or poor quality micronutrients); and (2) a lack of uniformity in the level of micronutrients between bags during production. While there was adequate retention of vitamin A and no loss of iron during shipping and storage of the commodities, the study identified significant losses in vitamin A and vitamin C from cooking at recipient sites. The MAP Report

described findings from the scientific study and recommended actions to improve the quality of fortified commodities (recommended actions are addressed under point four below)

### **3. Vitamin A Addition to Veg-Oil**

USAID asked SUSTAIN to review the feasibility of adding vitamin A to PL 480 refined, vegetable oil (vegoil). SUSTAIN prepared a comprehensive report on the technical and economic aspects of fortifying vegetable oil with vitamin A. The report emphasized that the stability of vitamin A in oil is greater than in other food vehicles, such as flour. It recommended the addition of vitamin A (in the form of retinol palmitate) at the addition level of at least 60 IU/g. Following the release of the report, USAID and USDA agreed to require the addition of vitamin A to vegoil, as well as to maintain the vitamin A requirements for blended and processed foods. The new vegoil requirement became effective on December 1, 1998. While this activity was not originally included in the scope of work for the MAP study, USAID asked SUSTAIN to draw on resources from a companion activity to carry out this work (see IFACS activity description below).

### **4. International Food Aid Commodity Secretariat (IFACS)**

In conjunction with the Vitamin C and MAP studies the International Food Aid Commodity Secretariat (IFACS) was formed to bring together USAID, USDA, commodity manufacturers, and PVOs to move forward toward implementing policies and activities to reduce micronutrient losses and improve the uniformity and quality of fortified food aid commodities. The Secretariat was initially asked to up-date the commodity list in the Commodities Reference Guide, to add current information on micronutrients and other commodity specifications, and to track various commodity issues in coordination with USDA. But as concerns about the stability and uniformity of micronutrients at the point of production became more apparent, USAID instructed SUSTAIN to put priority on addressing these issues first. The range of activities was later expanded to include: the review of vitamin A in vegoil, co-sponsorship of an international workshop on relief diets, coordination of a task group on iron-EDTA, and an assessment of the feasibility of local fortification of Food For Education commodities in Bangladesh.

#### **a) Improving the Quality of Micronutrient Fortified Commodities**

Through IFACS, SUSTAIN provided technical support and guidance to help strengthen commodity specifications and compliance programs. These activities were carried out in consultation and coordination with USAID/BHR, USAID/PHN, USDA, and commodity manufacturers. Results from these activities include:

- New requirements for the addition of vitamin A to vegetable oil were issued by USDA (Nov '98), enabling BHR's Office of Food for Peace (FFP) to provide fortified vegetable oil. Minimum and maximum levels were established. If products did not conform, they would be rejected.

- For the first time, USDA issued requirements for compliance with minimum end-product micronutrient specifications in fortified cereal-based foods (CSB, WSB, corn flour, wheat flour, and bulgur) provided under Title II. If these requirements are not met, the product will not be accepted. This is the first time that such Title II commodities would not be discounted if specifications were not met. In addition, it is the first time compliance with micronutrient specifications has been instituted.
- Vitamin A and iron were established as markers for monitoring compliance with micronutrient specifications. Following a voluntary phase-in period, deadlines for compliance with these new requirements were set for February 8, 2000 for some commodities and July 1, 2000 for others. This marked the first time that micronutrients in commodities distributed under Title II programs were monitored.
- USDA began moving forward on plans to incorporate PL 480 fortified commodities in their new Total Quality Systems Audits (TQSA) to help ensure compliance with the new micronutrient specifications.

**b) Revision of Commodity Reference Guide**

- **Part One:** Part One of the CRG relates to commodity specifications, including a list of commodities distributed through the Title II, PL 480 program. SUSTAIN revised Part One by updating the list of commodities to those currently distributed under the program, as well as expanding information on the commodities to include micronutrient, storage and other specifications. Subsequent to its revision, SUSTAIN posted Part One on USAID’s web-site for the first time to facilitate broader access and field use of this guide. It is currently housed on the USAID web site at [http://www.info.usaid.gov/hum\\_response/crg/](http://www.info.usaid.gov/hum_response/crg/)

**Parts Two:** Part Two provides guidance on selecting food aid commodities for Title II programs and consists of Section V and VI. Section V consists of an overview of Food for Peace programs, general guidelines for program design and commodity selection, and key considerations for five Title II food aid programs. Section VI consists of the annexes for use in designing food aid programs and calculating ration packages. Part Two was recently completed and put on the web. A debriefing for PVOs on the revision and use of Part Two was held in December 2000.

**c) Conferences & Meetings**

- *PAHO/LINKAGES Conference on Processed Complementary Foods:* In March 1999, SUSTAIN provided technical support for USAID/BHR’s participation in a technical consultation entitled “Processed Complementary Foods in Latin America: Why, Where and How?”, which was sponsored by PAHO and LINKAGES. Following the conference SUSTAIN assisted PAHO with preparation of the consultation’s proceedings by providing additional information

on P.L.480 commodities specifications, nutrient content information, and other characteristics of CSB and WSB.

- *Conference on Enhancing Quality of Relief Food:* At the request of USAID/BHR, SUSTAIN co-sponsored a workshop entitled “Enhancing Quality of Relief Foods” with the Food Aid Management (FAM) and Micronutrient Initiative (MI). This workshop was held on April 28-30, 1999 and involved a broad range of groups working on Title II emergency relief programs, including PVO’s, commodity manufacturers, and international agencies. SUSTAIN worked collaboratively with a coalition of groups to organize the workshop, select speakers, and prepare and edit conference proceedings. In addition, SUSTAIN provided partial funding for workshop logistics, participant travel and conference proceedings. These proceedings were printed and distributed in November 1999.
- *Debriefings for PVO’s on MAP & CRG:* In collaboration with Food Aid Management (FAM), SUSTAIN conducted a briefing for Private Voluntary Organizations (PVO’s) on the MAP study and an up-date on the revision of the CRG in June 2000. USAID/BHR, USAID/PHN, USDA and representatives from the commodity manufacturers were invited to participate in the briefing. To respond to significant PVO interest in the CRG, a more extensive presentation on the use of the revised CRG (with particular emphasis on Part II) was presented in December 2000 in collaboration with FAM.

#### **d) Technical Backstopping and Assistance**

Throughout the term of the IFACS, SUSTAIN provided technical support to USAID, USDA, commodity manufacturers and PVOs on a broad range of issues associated with commodity specifications, micronutrient requirements, ingredient characteristics, storage and handling, and quality assurance systems. Examples of such assistance include:

- USAID/BHR requested information regarding the addition of calcium and phosphorous to wheat soy blend (WSB) and corn soy blend (CSB). SUSTAIN provided technical information on calcium sources and phosphorous addition levels.
- Per a request from USAID/BHR regarding cost information of adding vitamin A to Title II foods, SUSTAIN estimated the difference between the price USAID paid for vitamin A and what the actual market price might have been without illicit price fixing.
- Per a request for information concerning restrictions on the use of potassium bromate (a flour ingredient, and suspected carcinogen), SUSTAIN provided information on current allowances for potassium bromate in all-purpose flour and bread flour.
- **Iron-EDTA Task Group** -- SUSTAIN organized and convened the Iron EDTA Task Group, a body of academic researchers and industry experts that met to discuss and make recommendations regarding the use of iron EDTA to address

iron deficiency anemia. Through the Task Group, SUSTAIN facilitated an exchange of information and current data between parties that are working with iron EDTA.

- **Assessment of Bangladeshi Initiative** -- In response to a request from USAID/Dhaka, SUSTAIN participated in an assessment of the micronutrient fortification of atta wheat flour in Bangladesh and the possible introduction of fortified atta into the Bangladesh Government's Food for Education (FFE) program. Information gathered during the trip and a subsequent analysis of atta indicated that the fortification of atta is technically feasible. Further, fortified atta wheat in lieu of the current whole wheat distributed in the FFE program would be an effective means to deliver deficit micronutrients to groups vulnerable to malnutrition in Bangladesh. The team recommended developing a pilot plan and proceeding with work to fortify donated wheat.

SUSTAIN has received a high level of support and recognition as a result of its work on improving micronutrients in food aid commodities. In a letter from the Deputy Assistant Administrator of USAID/BHR to the Deputy Assistant Administrator of USAID/G/PHN, SUSTAIN was cited as a key element in strengthening USAID's relationship with USDA. The MAP activity was said to have been critical in the review of micronutrient stability in Title II fortification of dry commodities. It was also instrumental in getting Vitamin A added to Title II edible refined vegetable oil. On July 2, 1999 the Secretary of Agriculture, the Honorable Dan Glickman, received a letter from the USAID Administrator, Brian Atwood, announcing significant enhancements in the quality of processed food aid commodities provided under the PL 480 Title II. Special recognition was given to SUSTAIN, USAID, and USDA representatives who had worked to effect the change.

### C. SUSTAIN AS AN ORGANIZATION

SUSTAIN's volunteer activities were first initiated in 1982 with grant assistance provided by USAID. Recognizing the opportunity and need for promoting the long-term continuity of SUSTAIN assistance activities, USAID provided authorization in the sixth amendment to the cooperative agreement for SUSTAIN to draw on resources under the agreement to establish itself as a non-profit corporation. The action endorsed recommendations from SUSTAIN's Steering Committee and USAID's mid-term evaluation for establishing a formal, legal organizational structure with the ability to attract and accept funds from outside of USAID; thus creating the potential to promote independent long-term continuity and expansion.

Drawing on pro-bono legal counsel and resources under this agreement, SUSTAIN incorporated as a non-profit and, in 1997 received 501(c)(3) tax-exempt recognition. In 1999, SUSTAIN entered into a collaborative agreement with PATH (*Program for Appropriate Technology in Health*), with the mutual goal of improving the health and nutritional needs of populations at risk in developing countries. PATH is an

internationally recognized institution focused on the transfer, introduction, and appropriate use of health technologies.

The tax-exempt, non-profit structure enables SUSTAIN to secure funding from private foundations (i.e. Bill & Melinda Gates Foundation), government and public agencies, and private and corporate contributions. This has further leveraged USAID funds and provided the means to expand assistance activities to vulnerable populations in developing countries.

#### **IV. RECOMMENDED NEXT STEPS**

The following are suggested next steps for USAID if it wishes to build on the Project SUSTAIN's results:

##### **A. Improving Quality of PL 480 Food Aid Commodities**

1. Develop mechanisms and processes within and between USAID and USDA for on-going review and monitoring PL 480 producers' compliance with micronutrient specifications, and for resolving current and future concerns associated with the quality and formulation of food aid products.
2. Develop mechanisms to ensure accuracy and consistency of lab assays and quality assurance systems reviewed through USDA's TQSA system.
3. Conduct research to improve formulation of P.L. 480 blended foods
4. Examine ways to improve retention of micronutrients in P.L. 480 foods during preparation and cooking by food aid recipients

##### **B. New Product Development**

1. Develop appropriate, low-cost highly nutritious food products
2. Review and assess cost-effective technologies for improving stability of micronutrients during processing and cooking, and for enhancing the bioavailability of essential micronutrients.
3. Implement marketing strategies to target specialized food/nutrition needs of vulnerable groups;

##### **C. Ensuring quality of local food products**

1. Provide continued support and technical assistance in quality assurance to help ensure local production of fortified staple foods deliver micronutrients and other essential nutrients to vulnerable populations in developing countries.
2. Provide follow-up to post-harvest activities to ensure the quality of post-harvest products developed during this CA.
3. Continue to focus on preservation of post-harvest crops with market potential, especially those crops, which are high in micronutrient content, and develop cost-effective and appropriate strategies for marketing these products.

4. Provide technical assistance in quality assurance to millers in developing countries to assure quality of fortified staple foods (there are indications that mills in developing countries are experiencing similar loss and stability problems at production as we observed in the MAP study).

## V. FINANCIAL SUMMARY AND IN-KIND SUPPORT

As part of the Cooperative Agreement, Project SUSTAIN was to leverage USAID funding with non-federal contributions. The value of the non-federal contributions toward the Project, including specialized volunteer in-kind services, in-country contributions, and contributions from industry partners exceeded the amount estimated in the cooperative agreement. The specialized assistance donated by SUSTAIN volunteers and host country partners has been a unique resource for the project and an instrumental factor that enabled SUSTAIN to implement a large number of activities with very limited funds.

### Federal Contribution

A total of \$5,000,000 was authorized for the life of the Cooperative Agreement. Of this authorization, \$4,886,994 was obligated with total expenditures equal to that amount. Thirteen modifications were made to the Cooperative Agreement, three of which were extensions. The first extension, Modification 6, extended the completion date for two years from October 1, 1996 to September 30, 1998. The second extension, Modification 10, extended the completion date to September 30, 1999. The third, a no-cost extension under Modification 11, extended the agreement completion date to September 30, 2000.

The value of the work performed by the SUSTAIN project is illustrated by the number of buy-ins received during the life of the project. The following table identifies the funding support received.

<u>Source</u>	<u>Activity Title</u>	<u>Obligated Amounts</u>
PHN	Core Project	\$ 3,225,000
LAC	Caribbean Regional Micronutrient Initiative	409,996
AFR	Africa Micronutrient / Small Enterprise Activity	500,000
BHR	International Food Commodity Secretariat	430,000
BHR	Vitamin C Pilot	320,000
<b>Total</b>		<b>\$ 4,884,996</b>

### Non-Federal Contribution

In addition, SUSTAIN was particularly successful in capitalizing upon the contributed time and energy of top-notch industry professionals and volunteers to implement many of SUSTAIN's activities. The total Non-Federal Contributions required under the agreement were \$1,852,233. SUSTAIN is very pleased to report total Non-Federal contributions received during the life of the agreement were \$1,898,658<sup>1</sup>, more than \$45,000 above the requirement.

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<sup>1</sup> SF-269, September 30, 2000.

## Appendix A: SUSTAIN'S Short-Term Activities 1991-2000

Country/Date	Activity Description
<b>Brazil</b> August 2000 November 2000	<p style="text-align: center;"><i>Technical Assistance to Brazilian Milling Industry</i></p> <p>A SUSTAIN team (composed of a fortification specialist and a miller from El Salvador) participated in a mobilization workshop on fortification for wheat and corn millers in Brazil. The workshop was hosted by Embrapa, a division of the Brazilian Ministry of Agriculture. The SUSTAIN counterparts spoke about fortification methods and successful fortification efforts in the U.S. and Latin America. Following the workshop, SUSTAIN hosted two Embrapa staff on visits to milling and baking facilities in the U.S. to observe process and quality assurance methods.</p>
<b>Russia</b> April 2000	<p style="text-align: center;"><i>Conference on Micronutrients in Russia</i></p> <p>U.S. and Russian agencies working under the former Gore-Chernomyrdin Commission requested SUSTAIN's participation in a workshop on micronutrients in Russia. Since SUSTAIN's initial visit to Russia in 1997, SUSTAIN volunteers have been providing technical support to a local company working to establish a micronutrient facility in Russia and to initiate fortification programs at local bakeries and dairy plants. SUSTAIN provided technical support to the Russian counterpart for a presentation at the conference. The Russian counterpart spoke on the need for government specifications and regulations to encourage wider application of fortification and on the successful start-up of bread and milk fortification in several Russian Oblasts.</p>
<b>Mexico</b> March 2000	<p style="text-align: center;"><i>ITESM World Food Needs Symposium</i></p> <p>At the invitation of the Monterrey Institute of Technology, SUSTAIN participated in a symposium on world food needs and challenges. SUSTAIN provided an overview of its programs and spoke on the challenges of global food issues and malnutrition. The workshop was hosted by the food science department of the Institute.</p>
<b>Brazil</b> March 2000	<p style="text-align: center;"><i>Assessment of Brazilian Milling Industry</i></p> <p>UNICEF/Brazil, the Ministry of Health and the Brazilian Agricultural Research Corporation (Embrapa) requested short-term technical support for its initiative to fortify corn and wheat products with iron. A SUSTAIN team visited Brazil to assess the fortification capacity of Brazilian millers and to help plan a mobilization workshop scheduled to take place in the summer of 2000.</p>

Country/Date	Activity Description
<b>Bangladesh</b> December 1999	<p style="text-align: center;"><b><i>Fortification of Wheat Flour in Bangladesh</i></b></p> <p>SUSTAIN participated in an assessment of the micronutrient fortification of atta wheat flour in Bangladesh and the possible introduction of fortified atta into the Government's Food for Education (FFE) program. Information gathered during the trip and a subsequent analysis of atta indicated that fortification of atta is technically feasible. Further, the team concluded that fortified atta wheat would be an effective means to deliver needed micronutrients to groups vulnerable to malnutrition. The team recommended developing a pilot plan and proceeding with work to fortify donated wheat. Representatives from USAID/BHR and USAID/PHN participated in the team assessment.</p>
<b>Seattle, WA</b> Oct.-Nov 1999	<p style="text-align: center;"><b><i>Annual Meeting of the American Association of Cereal Chemists 1999</i></b></p> <p>SUSTAIN hosted two symposia on issues associated with micronutrient fortification at the Annual Meeting of the American Association of Cereal Chemists (AACC). The first was delivered by Dr. Lena Davidsson, who presented findings from research carried out on the bioavailability of various iron compounds in corn masa flour. This research was sponsored by SUSTAIN and was carried out in collaboration with the Swiss Federal Institute of Technology and the Institute for Nutrition in Central America and Panama (INCAP). The second presentation was delivered by Dr. Rafael Camacho, who serves at the Advisor to the Mexican Ministry of Health and spoke on the government's landmark agreement with industry to initiate fortification of wheat and corn flour in Mexico.</p> <p>In addition, SUSTAIN cosponsored an evening reception with ingredient and fortification companies to raise awareness about Mexico's public/private sector initiative on fortification. Participants included senior executives from the cereal and ingredients industry in the U.S. and Mexico, government representatives, nutritionists and public health experts, SUSTAIN volunteers, and representatives from partnering organizations in Mexico, Brazil, Chile, and Russia.</p>
<b>Davis, CA</b> October 1999	<p style="text-align: center;"><b><i>Zinc Symposium</i></b></p> <p>A SUSTAIN industry specialist presented a paper and participated in a workshop on zinc entitled, "Zinc and Human Health: Results of Recent Intervention Trials and Implications for Programmatic Interventions and Program-Linked Research." The Symposium was hosted by the Micronutrient Initiative and University of California and covered:</p> <ul style="list-style-type: none"> <li>➤ 1) a review of the results of recent zinc intervention trials, focusing on the impact of enhanced zinc status on child survival and functional performance;</li> <li>➤ 2) a summary of the implications of these studies with regard to appropriate programmatic interventions, with special emphasis on dietary modification, supplementation, and fortification; and</li> <li>➤ 3) an identification of critical gaps in knowledge that may impede implementation of programmatic interventions.</li> </ul>

Country/Date	Activity Description
Guatemala City September 1999	<p style="text-align: center;"><i>Technical Meeting at INCAP's 50<sup>th</sup> Anniversary Conference</i></p> <p>In response to a request from the Institute for Nutrition of Central American and Panama (INCAP), Dr. Sean Lynch participated in the Institute's 50<sup>th</sup> Anniversary Meeting on September 7, 1999. Dr. Lynch made two presentations at the event: the first on the aspects of human iron metabolism as it relates to iron deficiency and the second on new important developments in iron fortification and the need for additional studies.</p>
Chicago, IL July 1999	<p style="text-align: center;"><i>Annual Meeting of the Institute of Food Technologists 1999</i></p> <p>As part of the 1999 annual meeting of the Institute of Food Technologists, held in Chicago SUSTAIN:</p> <ul style="list-style-type: none"> <li>➤ organized a technical forum to discuss issues related to vitamin A fortification. This panel included fortification experts from various sectors, including Watson Foods, USAID, Silliker Labs, and BASF. Topics included the magnitude of vitamin A deficiency, the SUSTAIN Micronutrient Assessment Project and technical solutions to enhance the stability of this labile vitamin in staple food products.</li> <li>➤ hosted a meeting with its corn masa flour advisory panel members Preliminary results from SUSTAIN's study on iron fortified corn masa flour and other cereal fortification studies as well as to propose next steps were discussed.</li> <li>➤ hosted a meeting of its Iron EDTA task force. The Iron EDTA task force agenda included overviews of research by SUSTAIN, ILSI, and MI along with a discussion of issues relevant to the use of Iron EDTA, i.e. toxicity, zinc-iron interactions and cost-benefit information.</li> <li>➤ co-hosted with the food industry an annual meeting for its volunteers to acknowledge past projects and discuss new initiatives.</li> </ul>
Washington, DC April 1999	<p style="text-align: center;"><i>Conference on Enhancing Quality of International Relief Foods:</i></p> <p>SUSTAIN co-sponsored a workshop entitled "Enhancing Quality of Relief Foods" with the Food Aid Management (FAM) and Micronutrient Initiative (MI). This workshop was held on April 28-30, 1999 and involved a broad range of groups working on Title II emergency relief programs, including PVO's, commodity manufacturers, and international agencies. SUSTAIN worked collaboratively with a coalition of groups to organize the workshop, select speakers, and prepare and edit conference proceedings. In addition, SUSTAIN provided partial funding for workshop logistics, participation of SUSTAIN industry volunteers, and conference proceedings. These proceedings were printed and distributed in November 1999.</p>

Country/Date	Activity Description
<p>Washington, DC March 1999</p>	<p style="text-align: center;"><i>Conference on Processed Complementary Foods</i></p> <p>SUSTAIN participated in a technical consultation organized by the Pan American Health Organization (PAHO) and USAID's Linkages project in Washington DC. The focus was primarily on reviewing experiences with complementary foods in Latin America and identifying keys to the success of such initiatives. SUSTAIN contributed information on formulations and the nutrient content and specifications for U.S. food aid blended commodities (corn soy blend (CSB) and wheat soy blend (WSB)).</p>
<p>Stuttgart, AR September 1998</p>	<p style="text-align: center;"><i>Workshop on Micronutrient Enhancement of Rice</i></p> <p>A SUSTAIN industry specialist participated in a workshop on technologies to enhance the micronutrient content of rice, which was held at the Rice Research and Extension Center at the University of Arkansas. The workshop provided a forum to review current technologies for rice fortification, as well as other interventions to enhance the micronutrient content of rice in developing countries. SUSTAIN also helped support the writing and publication of the workshop proceedings.</p>
<p>Guatemala September 1998</p>	<p style="text-align: center;"><i>Guatemalan Association of Food Technologists 1998 Congress</i></p> <p>Two SUSTAIN volunteers participated in the Guatemalan Association of Food Technologists' Biannual Congress. They spoke on the following topics: "Irradiation in Combination with Modified Atmosphere Packaging to Enhance the Safety of Minimally Processed Vegetables," and "Functional Foods: Benefits and Future."</p>
<p>Beirut, Lebanon July 1998</p>	<p style="text-align: center;"><i>Workshop on Flour Fortification in the Middle East and North Africa</i></p> <p>A SUSTAIN industry specialist participated in a regional workshop on iron deficiency and the resulting health and economic implications of iron fortification in the Middle East. The prevalence of iron deficiency anemia (IDA), the high consumption of flour in the Middle East, and the safe, effective, and inexpensive methods of combating IDA through micronutrient fortification were addressed.</p>

Country/Date	Activity Description
<p><b>Russia</b> June-July 1998</p>	<p style="text-align: center;"><i>Technical Assistance to Advance Russian Flour Enrichment</i></p> <p>A SUSTAIN volunteer participated in a technical assistance visit to Russia to help support micronutrient initiatives in iron, iodine, selenium, and flouride. The visit was organized in collaboration with the Centers for Disease Control and Prevention (CDC) and the Federal Drug Administration (FDA) as an extension of activities previously conducted under the auspices of the Gore-Chernomyrdin Commission's Health Committee.</p> <p>The SUSTAIN volunteer provided technical support to help assess the needs and capabilities of Russian mills and bakeries in fortification. The volunteer also provided assistance to a Russian company interested in establishing a vitamin and mineral premix distribution business in the region. As a result of this assistance, the Russian company succeeded in helping to launch the fortification of bread and milk in several Russian Oblasts.</p>
<p><b>Atlanta, GE</b> June 1998</p>	<p style="text-align: center;"><i>Annual Meeting of the Institute of Food Technologists 1998</i></p> <p>SUSTAIN participated in 1998 IFT Annual Meeting held in Atlanta, GA. During the conference SUSTAIN:</p> <ul style="list-style-type: none"> <li>➤ Organized a special forum on "Iron Fortification of Foods." The Forum brought speakers from research institutes and government/non government agencies together to discuss various issues dealing with iron fortification.</li> <li>➤ Prepared and presented two poster sessions on "Stability of Vitamin A and Vitamin C in Food Aid Commodities" and "Stability of Vitamin A and Vitamin C during Cooking of Food Aid Commodities." These presentations were both based on reports authored by SUSTAIN in connection with SUSTAIN's Micronutrient Assessment Project which found that fortified U.S. PL 480 commodities do not deliver consistent levels of vitamin A to aid recipients in developing countries.</li> <li>➤ Sponsored a participant training for a food technologist from the Ghana Atomic Energy Commission (Department of Food Science and Radiation Processing) to attend the 1998 IFT meeting. The participant was able to gain valuable knowledge on topical issues in food science and technology, which could be used in her research activities and shared with colleagues in Ghana.</li> <li>➤ Organized and held an annual meeting for more than 100 SUSTAIN volunteers. The meeting provided attendees a chance to share information and contacts as well as an opportunity for SUSTAIN staff to personally interact with current volunteers and disseminate information to potential volunteers</li> </ul>

Country/Date	Activity Description
<p><b>San Pedro Sula, Honduras</b> February 1998</p>	<p style="text-align: center;"><b><i>Food Safety Workshops: Part II: Food Plant Sanitation and Good Manufacturing Practices</i></b></p> <p>A series of two workshop were offered by SUSTAIN Volunteers from Silliker Laboratories Group, Inc. in collaboration with two local organizations: FIDE (Foundation for Investment and Development of Exports) and AgriBio Tek Laboratories. The workshops trained key personnel from food processing companies in the principles of sanitation and hygiene in food plants.</p> <p>The second workshop in the food safety series addressed Good Manufacturing Policies (GMP) and sanitation and hygiene in the food plant. Topics included microbiology of the food plant, hygienic consideration of equipment and facility design, employee practices and food plant sanitation, pest control, and quality control. The workshops attracted over 80 participants, including Honduran food industry technicians, quality assurance managers, and government regulators.</p>
<p><b>Tegucigalpa, Honduras</b> November 1997</p>	<p style="text-align: center;"><b><i>Food Safety Workshops: Part I: HACCP</i></b></p> <p>The objective of the two-part workshop series in food safety was to transfer systems and techniques for assuring the quality and safety of food products to personnel from local food manufacturing plants. Topics included hazard analysis and critical control points (HACCP) and HACCP monitoring and verification. Applied learning through practical exercises was emphasized, allowing participants to develop their own plans for setting up a HACCP plan.</p>
<p><b>Arusha, Tanzania</b> November 1997</p>	<p style="text-align: center;"><b><i>Eastern and Southern Africa Regional Consultation on Anemia</i></b></p> <p>SUSTAIN participated in an African Consultation on Anemia, sponsored by UNICEF and the Micronutrient Initiative, and spoke on food fortification as one of several possible methods for combating anemia. The conference provided an overview of micronutrient deficiency challenges in southeast Africa and an opportunity to exchange information on strategies for addressing these concerns.</p>
<p><b>West Lafayette, Indiana, USA</b> October 1997</p>	<p style="text-align: center;"><b><i>Participant Training: Purdue University Food Manufacturing Center Visit</i></b></p> <p>At the request of a plant manager in Guatemala, a SUSTAIN volunteer arranged for a group of Guatemalans to visit the Purdue University Food Manufacturing Center to learn more about computerized automations and new technologies for canning. A processing specialist with Purdue showed the group examples of modernization in container handling, retort operation, and automation. The Alimentos Kern plant manager reported that he intended to apply some of the techniques he learned at Purdue upon his return to Guatemala.</p>
<p><b>San Diego, CA</b> October 1997</p>	<p style="text-align: center;"><b><i>Annual Meeting of the American Association of Cereal Chemists 1997</i></b></p> <p>SUSTAIN participated in the 82<sup>nd</sup> Annual Meeting of the American Association of Cereal Chemists and presented a paper entitled "Uniformity of Micronutrients Added to Milled Cereal Products." SUSTAIN also met with executives from international corporations and with industry volunteers active in the Vitamin C and MAP projects.</p>

Country/Date	Activity Description
<p><b>Russia</b> June/July 1997</p>	<p style="text-align: center;"><i><b>Moscow Micronutrient Workshop</b></i></p> <p>A SUSTAIN team participated in a consultation organized by the U.S. and Russian governments to discuss public health problems associated with deficiencies of fluoride, iodine, selenium and iron in Russia. The meeting was organized under the auspices of the Gore-Chernomyrdin Commission's Health Committee. A SUSTAIN specialist in fortification spoke on iron fortification technologies for flour and a volunteer from H.J. Heinz spoke on the nutritional needs of infants and women of child-bearing age. Iron deficiency anemia was reported to affect one-third of the women and children in Russia.</p> <p>The SUSTAIN team also met with a businessman interested in developing a fortification pre-mix company in Russia and with bakeries interested in fortification. As a result of discussions during this consultation, the H.J. Heinz Company decided to launch a new kasha-based fortified food product in Russian markets. The fortified form of kasha, a commonly eaten cereal in Russia, is designed to provide women much needed vitamin A, iron, folic acid, B vitamins, selenium and zinc.</p>
<p><b>Orlando, FL</b> June 1997</p>	<p style="text-align: center;"><i><b>Marketing Forum on Nutrient Enhanced Foods</b></i></p> <p>SUSTAIN organized a forum on 'Marketing Opportunities for Nutritionally Improved Hispanic Foods' at the Annual Meeting of the Institute of Food Technologists. At the forum speakers from academia and industry presented various perspectives on the market for Hispanic foods, the nutritional awareness of Latin American consumers, and technological advancements in the nutritional content of Hispanic foods. The forum also explored the feasibility of fortifying new products, such as centrally processed corn masa flour, with iron.</p>
<p><b>Nicaragua</b> June 1997</p>	<p style="text-align: center;"><i><b>Assessment of soy processing operation</b></i></p> <p>A SUSTAIN Volunteer provided technical assistance to a Nicaraguan company (GRACSA) to evaluate changes GRACSA would have to make to produce soy milk and other soy products for human consumption. The company currently produces soy products for animal feed.</p>
<p><b>Guatemala</b> May 1997</p>	<p style="text-align: center;"><i><b>Seminar on Packaging - AGTA</b></i></p> <p>A SUSTAIN volunteer participated in a seminar on packaging organized by the Guatemalan Association of Food Technologists (AGTA). The volunteer spoke on trends and technology in food and beverage packaging and discussed how these technologies can aid nutrient retention and prevent food spoilage. The volunteer also provided technical assistance in packaging to four food processing companies.</p>

Country/Date	Activity Description
<b>El Salvador</b> Feb. 1997 March 1997 May 1997	<p style="text-align: center;"><b><i>Workshops on Food Safety &amp; Quality Assurance – A Three Part Series</i></b></p> <p>Two SUSTAIN Volunteers from Silliker Laboratories Group conducted a three-part series of workshops on food safety and quality assurance systems in El Salvador. The objective of the workshop series was to train technical managers working in the Central American food industry on the principles of sanitation and hygiene in food plants, Good Manufacturing Practices, and Hazard Analysis Critical Control Points.</p> <ul style="list-style-type: none"> <li>➤ Workshop One covered topics including: microorganisms in food processing environments, hygienic considerations, cleaning and sanitizing.</li> <li>➤ Workshop Two covered topics including: food microbiology, Good Manufacturing Practices, pest control, and inspection systems.</li> <li>➤ Workshop Three covered topics including: the seven principles of Hazard Analysis Critical Control Points (HACCP).</li> </ul> <p>The workshops were organized in collaboration with FUSADES (Salvadoran Foundation for Social and Economic Development) and CLUSA (Cooperative League of the USA).</p>
<b>Honduras and Nicaragua</b> Aug./Sept. 1996	<p style="text-align: center;"><b><i>Food Safety Assessment of Meat Processing Plants</i></b></p> <p>A SUSTAIN volunteer assessed the Honduran meat industry's need for technical assistance with particular reference to recent regulations issued by the USDA that would mandate HACCP systems for all U.S. meat plants, as well as non-U.S. plants that want to export meat to the U.S. In addition, the volunteer conducted an assessment of a slaughter and packaging operation in Nicaragua at the request of CARNIC, a Nicaraguan slaughter and packaging operation. Recommendations were issued on options for automation, by-product utilization, and systems to reduce the costs of production.</p>
<b>Guatemala</b> August 1996	<p style="text-align: center;"><b><i>INCAP Forum on Market Opportunities for Fortified Foods</i></b></p> <p>SUSTAIN arranged for a representative of an ingredients company to participate in a forum hosted by INCAP on market opportunities for fortified foods in Central America.</p>
<b>Russia (Voronezh)</b> July/August 1996	<p style="text-align: center;"><b><i>Feasibility of Starting Juice Processing Facility</i></b></p> <p>A SUSTAIN volunteer assessed the feasibility of expanding production facilities at a dairy plant in Russia so that it could also produce fruit juice products. The products were to be marketed in northwestern Russia and were envisioned as an opportunity to increase the supply of vitamin-rich products in the region.</p>
<b>Washington, DC,</b> June 1996	<p style="text-align: center;"><b><i>Preparatory Meeting for the World Food Summit</i></b></p> <p>SUSTAIN presented comments at the U.S. government-sponsored preparatory meeting for the United Nations World Food Summit on goals for the Summit.</p>

Country/Date	Activity Description
New Orleans, LA June 1996	<p style="text-align: center;"><i>Institute of Food Technologists/Participants from Africa</i></p> <p>SUSTAIN hosted IFT participants from Tanzania, Zambia, and Zimbabwe at its symposium and volunteer meeting and reception. This was organized in conjunction with the USAID/AFR Bureau.</p>
New Orleans, LA June 1996	<p style="text-align: center;"><i>Trade Trends in Food Ingredients Symposium</i></p> <p>SUSTAIN and the International Division of the Institute of Food Technologists co-sponsored a symposium at the IFT's 1996 Annual Meeting entitled, "International Trade Trends in Food Ingredients: Improving Nutrition in the Balance." Speakers spoke on the expanding global market for the export and import of food ingredients, nutrients, and additives, and the importance of quality maintenance systems in exporting nations.</p>
Guatemala April 1996	<p style="text-align: center;"><i>Guatemalan Association of Food Technologists (AGTA) Congress</i></p> <p>Two SUSTAIN volunteers participated in a biannual congress of the Guatemalan Association of Food Technologists (AGTA). A volunteer from Nabisco gave a presentation on "Technological Trends in the Food Industry" and a volunteer from the U.K.-based International Food Information Service (IFIS) gave a presentation on "Information Systems for Food Technologists". In addition to giving presentations at the AGTA congress, these volunteers gave technical presentations to students of food science and technology at the Universidad Del Valle De Guatemala. Both experts had extensive one-on-one interaction with participants at the congress and students from the university.</p>
India, the Philippines, and Indonesia March 1996	<p style="text-align: center;"><i>Seafood HACCP Training</i></p> <p>Two SUSTAIN volunteers participated in a series of workshops on HACCP quality assurance requirements for seafood products that were held in March 1996 in Cochin (India), Jakarta (Indonesia), and Manila (The Philippines). The workshops were organized by USAID, SUSTAIN, USDA and Technical Assessment Systems, Inc. The workshops provided an overview of imminent U.S. mandatory requirements for HACCP quality assurance systems for all seafood products imported into the U.S. Participants included Asian seafood processors, exporters, and other interested parties.</p>
El Salvador March 1996	<p style="text-align: center;"><i>Cheese Processing Training</i></p> <p>A SUSTAIN volunteer provided training in general and specialty cheese processing technologies, with emphasis on goat cheese, at a workshop organized by the National Agriculture School (ENA) of El Salvador. The volunteer also gave several lectures on hygiene and sanitation in dairy processing and emphasized the importance of pasteurization. As a result of the volunteer training, the ENA began operating a small pasteurization unit that was located at the pilot plant and had not previously been in use.</p>

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<b>Country/Date</b>	<b>Activity Description</b>
<b>El Salvador</b> February 1996	<b><i>Organic Coffee Processing III Technical Assistance</i></b> A SUSTAIN Volunteer provided technical assistance in coffee processing to an agricultural cooperative in El Salvador as the third in a series of technical assistance visits. The SUSTAIN volunteer advised UCRAPROBEX (a coffee growers' cooperative that produces and exports about 12% of the coffee in El Salvador) on the kind of roasting, grinding and packaging technologies necessary to expand the manufacture and sale of organic coffee beyond El Salvador to reach other consumers in Central America.
<b>Guatemala</b> December 1995	<b><i>Fruits &amp; Vegetables Processing Training</i></b> A SUSTAIN volunteer trained PROFRUTA technicians in the processing of fruits and vegetables, a natural source of vitamins and minerals, in Guatemala. In a letter to SUSTAIN, the Executive Director of PROFRUTA stated that as a result of this activity, technical assistance was now being provided "to groups of indigenous peasants (men and women), who are interested in performing agro-industrial activities as a means of diversifying their income sources."
<b>OH/PA</b> November 1995	<b><i>Visit of Russian Dairy Personnel to U.S. Facilities</i></b> A SUSTAIN volunteer from a dairy plant in Pennsylvania hosted two technicians from Russian dairy plants on a tour of U.S. dairy and packaging plants in Ohio and Pennsylvania.
<b>Washington DC</b> October/Nov 1995	<b><i>USAID/Africa Bureau Trade and Investment Promotion Advisors Workshop</i></b> Two SUSTAIN volunteers participated in a workshop organized by USAID/AFR on trade and investment in food industries. Participants included representatives from African municipal, regional, and national governments who promote trade and investment through technical assistance to small and medium-sized businesses. Volunteers covered topics including food processing technologies, marketing, and natural products.
<b>Guatemala &amp; El Salvador</b> September 1995	<b><i>Assessment of Food Safety &amp; Quality Assurance Training</i></b> A SUSTAIN team conducted an assessment of previous SUSTAIN workshops in food safety and quality assurance conducted in Central America. The goal of the assessment was to gather input from industry, government and participants in prior workshops to assist in the design of a future training series in food hygiene, plant sanitation, Good Manufacturing Practices, quality assurance, & HACCP.
<b>Guatemala</b> September 1995	<b><i>INCAP Anniversary Conference</i></b> Presentation on "Globalizing Trade & Nutrition: Opportunities to Improve the Diet of Central American Populations".

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<b>Country/Date</b>	<b>Activity Description</b>
<b>Russia (Tver Oblast)</b> September '95	<b><i>Dairy Processing II Training</i></b> A SUSTAIN volunteer delivered training in dairy product processing, production, packaging, and marketing as the second of a two-part training series in Russia. The volunteer also provided one-on-one technical assistance to dairy processors.
<b>Honduras</b> August 1995	<b><i>Fruits &amp; Vegetables Processing Training</i></b> A SUSTAIN Volunteer conducted training on fruit and vegetable processing technologies, including instruction on preservation techniques, quality control, and canning regulations for plant managers and technicians at a workshop in Honduras. The workshop was organized by the Chamber of Commerce of Northern Honduras for technical managers working in local food processing companies.
<b>Russia</b> June 1995	<b><i>Marketing Training</i></b> Two SUSTAIN Volunteers provided training on the fundamentals of marketing for small and newly-privatized food manufacturing businesses in Russia. Subjects covered included consumer trend analysis, packaging, pricing, advertising, and promotion.
<b>Anaheim, CA</b> June 1995	<b><i>Food Safety and Quality Assurance Forum</i></b> SUSTAIN sponsored a forum at the Institute of Food Technologists 1995 Annual Meeting entitled "Food Safety and Quality Challenges in Emerging Markets: Sharing the Means to Address Barriers and Opportunities." Speakers addressed issues associated with food safety hazards and goals for harmonized standards in bilateral and multilateral trade agreements.
<b>Washington, DC</b> <b>Anaheim, CA</b> May/June 1995	<b><i>Participant Training - Uganda &amp; Madagascar</i></b> USAID/AFR/PSG&E and SUSTAIN hosted the Director of the Ugandan Bureau of Standards and the Manager of AFAFI, a company in Madagascar, at the 1995 Annual Meeting of the Institute of Food Technologists. SUSTAIN also organized informational meetings for the Ugandan participant in Washington, D.C. with organizations including the National Food Processors Association, the U.S. Department of Agriculture, and the Food and Drug Administration.
<b>Indonesia</b> May 1995	<b><i>Organic Coffee Technical Assistance</i></b> A SUSTAIN Volunteer provided technical assistance in roasting, grinding, packaging, and equipment needs for processing, marketing, and distribution of organic coffee to a coffee cooperative in Indonesia.

Country/Date	Activity Description
<p>Washington, DC April 1995</p>	<p style="text-align: center;"><b><i>USAID/Africa Bureau Collaborators Workshop</i></b></p> <p>SUSTAIN volunteers and staff participated in a workshop organized by USAID/AFR to evaluate, prioritize, and plan USAID private sector development objectives and activities in sub-Saharan Africa. Workshop participants included individuals from African universities, businesses, and governments.</p>
<p>Guatemala March 1995</p>	<p style="text-align: center;"><b><i>Bakery Technologies &amp; Quality Control II Training</i></b></p> <p>A SUSTAIN Volunteer provided training in baking and quality assurance technologies to personnel from bakery plants and mills in Guatemala. Subjects covered included ingredient functionality, equipment and plant maintenance, and quality control for product quality and safety.</p>
<p>Russia Jan/Feb '1995</p>	<p style="text-align: center;"><b><i>Dairy Product Development I Training</i></b></p> <p>A SUSTAIN Volunteer provided training and technical assistance in dairy processing, product development, and quality control to dairy plant personnel in Russia. This was the first in a series of two workshops.</p>
<p>Nepal Jan/Feb 1995</p>	<p style="text-align: center;"><b><i>Assessment of Dairy Processing</i></b></p> <p>A SUSTAIN Volunteer conducted an assessment of options for dairy farmers and small dairy plants to improve milk quality, diversify processing technologies, and improve packaging, storage, and handling practices in Nepal.</p>
<p>El Salvador January '1995</p>	<p style="text-align: center;"><b><i>Turnaround Assessment: Fisheries Cooperative Facility</i></b></p> <p>A team of two SUSTAIN Volunteers conducted an assessment of the “turnaround” potential of a seafood cooperative in El Salvador. Issues examined included the financial status of the cooperative, the condition of the facility and remaining equipment, and market demand for the cooperative’s products.</p>
<p>Guatemala November 1994</p>	<p style="text-align: center;"><b><i>Hazard Analysis Critical Control Points Training</i></b></p> <p>Two SUSTAIN Volunteers conducted a short course on the Hazard Analysis Critical Control Point (HACCP) system for technical managers working in the Central American food industry. The team also visited several Guatemalan food processing companies and provided technical assistance on microbiological safety and quality of foods. The activities were organized in conjunction with the Guatemalan Association of Food Technologists (AGTA) and the Institute of Nutrition of Central America and Panama (INCAP).</p>

Country/Date	Activity Description
El Salvador September 1994	<p style="text-align: center;"><i>Organic Coffee Processing II Technical Assistance</i></p> <p>A SUSTAIN Volunteer provided technical assistance in coffee processing to an agricultural cooperative in El Salvador. The assistance was provided in roasting, grinding, packaging, equipment installation and quality control and was the second in a series of three technical assistance visits. The coffee cooperative produced an organic line of coffee, known as Pipil.</p>
Zambia September 1994	<p style="text-align: center;"><i>Essential Oils, Flavors, Spices, &amp; Natural Ingredients</i></p> <p>USAID/AFR organized this workshop and requested the participation of SUSTAIN volunteers, who presented information on preservation, packaging, marketing strategies, international quality specifications, small business development, and value-added products.</p>
Guatemala August 1994	<p style="text-align: center;"><i>Marketing Seminar</i></p> <p>Two SUSTAIN Volunteers provided training in the fundamentals of marketing and advertising to food plant managers and marketing professionals in the Central American food industry. Seminar attendees were taken through a "soup-to-nuts" agenda, including how to evaluate TV, print and radio creative advertising, marketing on a small budget, why new products fail, and how to increase sales for brands and nutritional staples.</p>
Honduras July 1994	<p style="text-align: center;"><i>Food Safety &amp; Quality Control Training</i></p> <p>A team of SUSTAIN Volunteers conducted a workshop on good manufacturing practices, basic plant sanitation, and quality control for technical managers of food manufacturing plants in Honduras. The team also provided technical assistance during site visits to four food processing plants. The workshop was organized in collaboration with the Northern Honduras Chamber of Commerce (Intercham).</p>
Guatemala July 1994	<p style="text-align: center;"><i>Fruits &amp; Vegetables Processing Training</i></p> <p>A SUSTAIN Volunteer conducted training on fruit and vegetable processing at a workshop organized in collaboration with INCAP (Institute of Nutrition of Central America and Panama). The training was provided to supervisors and technicians working in the Central American food industry and covered subjects including: preservation techniques for maximum nutrient retention, quality control, and canning regulations.</p>
Indonesia July 1994	<p style="text-align: center;"><i>Flour Milling &amp; Fortification Assessment</i></p> <p>A SUSTAIN Volunteer provided technical assistance to a small company in Indonesia interested in constructing a mill for high-protein, low-ash bread flour. The Volunteer advised on facility design and milling technologies. He was later hired by the company to manage and oversee the construction and start-up of the facility.</p>

<b>Country/Date</b>	<b>Activity Description</b>
Guatemala April 1994	<p style="text-align: center;"><b><i>Sensory Evaluation Techniques III Training</i></b></p> <p>In collaboration with INCAP a SUSTAIN volunteer conducted the third in a series of three workshops for food professionals in Central America on the use of sensory evaluation techniques and the application of these techniques to the processes of product development and quality control.</p>
Guatemala April 1994	<p style="text-align: center;"><b><i>Congress of Guatemalan Association of Food Technologists (AGTA)</i></b></p> <p>A team of four SUSTAIN volunteers and one staff member participated in a conference organized by the Guatemalan Association of Food Technologists, and gave presentations on global food market trends, pesticide residue and export regulations, Hazard Analysis Critical Control Points (HACCP), and total quality management.</p>
Guatemala February 1994	<p style="text-align: center;"><b><i>Bakery Short Course</i></b></p> <p>As part of a training for bakers on functional properties of bakery ingredients and their effect on finished products, a SUSTAIN Volunteer conducted sessions on preventative equipment maintenance and sanitation as related to the baking industry and fortification of baked products.</p>
Burkina Faso January 1994	<p style="text-align: center;"><b><i>Potato Storage II Technical Assistance</i></b></p> <p>A SUSTAIN Volunteer provided technical assistance to a potato growers' cooperative in the design and construction of a potato storage facility and evaluated options for dehydration or refrigeration of potato crops to avoid food spoilage. The assistance was provided as the second of a series of technical assistance visits. However, no additional visits could be made after this January visit because the USAID mission closed out of Burkina Faso shortly after this activity's completion and instructed cooperating agencies to phase out all assistance activities.</p>
Cameroon October 1993	<p style="text-align: center;"><b><i>Assessment of Agricultural Research &amp; Development Programs</i></b></p> <p>Two SUSTAIN Volunteers participated in an assessment of opportunities for reorganizing agriculture research and extension institutions in Cameroon to better address problems and needs of small and medium sized food businesses. No follow-up work could be undertaken because the USAID mission closed out of Cameroon shortly after the SUSTAIN assignment and instructed cooperating agencies to phase out all assistance activities.</p>
El Salvador December 1993	<p style="text-align: center;"><b><i>Organic Coffee Processing I Technical Assistance</i></b></p> <p>As the first in a series of three technical assistance visits, a SUSTAIN volunteer provided technical assistance to a coffee cooperative that was gearing up to produce an organic line of coffee, known as Pipil. Assistance was provided in roasting, grinding, packaging, equipment installation, and quality control.</p>

<b>Country/Date</b>	<b>Activity Description</b>
<b>Uganda</b> November 1993	<b><i>Marketing &amp; Quality Control Training</i></b> Two SUSTAIN Volunteers provided training in marketing, food safety, and quality assurance at a workshop organized in collaboration with the Uganda Manufacturers Association.
<b>Guatemala</b> November 1993	<b><i>Sensory Evaluation Techniques II Training</i></b> As the second in a three -part series of workshops, a SUSTAIN Volunteer conducted training on sensory evaluation methods at a workshop organized by INCAP. Subjects covered included the application of laboratory techniques, statistics, and consumer focus panels to evaluate consumer acceptance and preference of food products.
<b>South Pacific</b> November 1993	<b><i>Organic Production &amp; Marketing</i></b> A SUSTAIN Volunteer provided technical assistance on methods for organic crop production and marketing to a group of Samoan farmers, which ultimately was successful in growing and marketing organic vanilla. This activity was a follow-up to the SUSTAIN volunteer's participation in the Agricultural Products Quality Workshop in Manila in May of 1993.
<b>Guatemala</b> October '93	<b><i>Food Safety &amp; Quality Control II</i></b> As the second of a two-part workshop series on food safety and quality assurance, three SUSTAIN volunteers provided training on food safety and quality assurance to technical managers from local food processing companies in conjunction with local instructors. Subjects covered included: plant sanitation, good manufacturing practices, and quality control.
<b>Burkina Faso</b> August-Sept 1993	<b><i>Potato Storage I Technical Assistance</i></b> As the first of a two-part series of technical assistance visits, a SUSTAIN Volunteer provided technical assistance to a potato growers' cooperative in the design and construction of a potato storage facility to minimize losses from food spoilage.
<b>Burkina Faso</b> August-Sept 1993	<b><i>Corn Milling Technical Assistance</i></b> A SUSTAIN Volunteer provided technical assistance to improve the quality of a dry milled corn product at a state-owned flour mill in Burkina Faso.
<b>Uganda</b> August 1993	<b><i>Packaging Training</i></b> A SUSTAIN Volunteer provided training and technical assistance on packaging techniques to promote nutrient retention and minimize losses from spoilage. The activities were organized in collaboration with the Uganda Manufacturers' Organization.

<b>Country/Date</b>	<b>Activity Description</b>
<b>Belize</b> August '1993	<i>Assessment Mission to Belize</i> A team of two SUSTAIN Volunteers and a staff member conducted an assessment of opportunities for developing microenterprise food businesses in Belize. The assessment was carried out in conjunction with the micro-enterprise division of the Inter-American Development Bank. No follow-up work could be undertaken because the USAID mission closed out of Belize shortly after the SUSTAIN assignment and instructed cooperating agencies to phase out assistance activities.
<b>Guatemala</b> August '1993	<i>Technical Assistance in Baking and Quality Assurance Technologies</i> A SUSTAIN Volunteer conducted an assessment of process and quality control practices of local bakeries manufacturing a nutritionally fortified cookie and of the commercial feasibility of a Vitamin A rich children's cereal from sweet potatoes. The Volunteer also identified training needs for local bakeries. The activities were organized by INCAP.
<b>Guatemala</b> August 1993	<i>Food Safety and Quality Assurance I Training</i> As the first in a two-part series, a team of SUSTAIN Volunteers provided training in good manufacturing practices, plant sanitation, and hygiene for line workers and technicians. The activities were organized in conjunction with INCAP (Institute of Nutrition of Central America and Panama) and the Guatemalan Association of Food Technologists (AGTA).
<b>U.S.</b> July 1993	<i>Participant Training</i> SUSTAIN sponsored a representative from the Uganda Manufacturers Association to participate in various training activities in the U.S. The training included participating in seminars on information management systems, attendance at the IFT Annual Meeting, and tours of U.S. food manufacturing plants.
<b>Panama and Wisconsin</b> July 1993	<i>Waste Handling/Utilization in Slaughterhouses</i> A SUSTAIN Volunteer arranged for a group from ICAITI (Instituto Centroamericano de Investigacion y Tecnologia Industrial) to see and discuss methods of waste handling in slaughterhouses for purposes of pollution prevention and waste by-product utilization.
<b>Philippines</b> May 1993	<i>Agricultural Products Quality Workshop</i> A team of SUSTAIN Volunteers and staff member participated in a workshop on agricultural products and quality control in the Philippines. The team spoke on organic marketing and certification requirements, food safety and quality assurance, fisheries, and spices and milling technologies. This activity was carried out in conjunction with USAID/Asia and USDA. Following the workshop, SUSTAIN was asked to send one of the volunteers to the South Pacific for technical assistance in organic production and marketing.

<b>Country/Date</b>	<b>Activity Description</b>
<b>Russia</b> May 1993	<b><i>Technical Assessment</i></b> A SUSTAIN staff member conducted an assessment of needs for technical assistance and training in food processing and marketing in the Tver Oblast (administrative district) of Russia. Technical assistance was subsequently provided in collaboration with other organizations.
<b>Guatemala</b> March/April 1993	<b><i>Food Safety and Quality Assurance Assessment</i></b> A SUSTAIN team conducted an assessment of food manufacturers' needs in quality assurance/control and GMP to determine the design for a series of workshops and criteria for trainee participation.
<b>Guatemala</b> March 1993	<b><i>Sensory Evaluation Techniques I Training</i></b> As the first in a series of three workshops on sensory evaluation, a SUSTAIN Volunteer provided training for food industry professionals in Central America on sensory evaluation techniques and their application to product development and quality control.
<b>Uganda</b> March/April 1993	<b><i>Food Technology Assessment</i></b> A SUSTAIN team conducted an assessment of technical assistance and training needs of the food industry in Uganda.
<b>Barbados</b> February 1993	<b><i>Turnaround Assessment: Fruit and Vegetable Processing Cooperative</i></b> A SUSTAIN Volunteer conducted a financial and business analysis of options for rejuvenating a defunct Barbados agro-processing cooperative.
<b>Guatemala</b> March 1993	<b><i>Food Industry Survey</i></b> SUSTAIN helped support a survey of local food processors to identify specific needs for technical assistance and training that could be addressed collaboratively by SUSTAIN, INCAP, and AGTA (Guatemalan Association of Food Technologists).
<b>Nepal</b> December 1992	<b><i>Feasibility of Establishing Commercial Food Testing Laboratory</i></b> A SUSTAIN team conducted an assessment of the feasibility of establishing a private food testing laboratory to address food safety concerns and help increase the competitiveness of Nepali food products in international trade.
<b>Hungary</b> November 1992	<b><i>Incubator Feasibility Assessment II</i></b> Second in a pair of assessments on the feasibility of developing a center for technology commercialization and agribusiness innovation in Hungary.

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<b>Country/Date</b>	<b>Activity Description</b>
<b>Guatemala</b> September 1992	<b><i>INCAP 40<sup>th</sup> Anniversary Conference</i></b> Presentations on product development, marketing, food fortification, and quality assurance in addressing food & nutritional needs in Central America.
<b>Hungary</b> August 1992	<b><i>Incubator Feasibility Assessment I</i></b> First in a pair of assessments of the feasibility of developing a center for technology commercialization and agribusiness innovation in Hungary.
<b>Guatemala &amp; Honduras</b> July 1992	<b><i>Extrusion and Flavor Technologies</i></b> A SUSTAIN team training in the application of extrusion and flavor technologies at workshops organized for technical managers of local food plants in Guatemala and Honduras. The workshops were organized in collaboration with INCAP and the Northern Honduras Chamber of Commerce (Intercham).
<b>Guatemala</b> July 1992	<b><i>Pilot Plant Assessment</i></b> A SUSTAIN Volunteer conducted an assessment of INCAP's pilot plant building and equipment and provided recommendations for improvement.
<b>Mexico</b> July 1992	<b><i>Technical Assistance in Production of Goat Cheese</i></b> A SUSTAIN Volunteer provided technical assistance in processes for small-scale production of goat cheese. Topics covered included: equipment sanitation, pasteurization, and small-scale cheese processing technologies.
<b>Illinois/DC</b> June 1992	<b><i>Participant Training Support</i></b> SUSTAIN sponsored a professor of food science from a Ugandan University to participate in a short-course on soybean processing at INTSOY, University of Illinois.
<b>Honduras</b> June 1992	<b><i>Technical Assistance: GMP and Pickling</i></b> A SUSTAIN Volunteer provided technical assistance to local company in Honduras on pickling technologies for vegetables, quality assurance and Good Manufacturing Practices.
<b>Guatemala</b> May 1992	<b><i>Organic Marketing Workshop</i></b> A SUSTAIN Volunteer provided training on the production and marketing of organic foods in conjunction with marketing workshop hosted by the Guatemalan Association of Food Technologists.

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<b>Country/Date</b>	<b>Activity Description</b>
<b>Guatemala</b> April 1992	<i>Seminar on Mycotoxins</i> A SUSTAIN Volunteer provided training on low-cost technologies to detect and prevent mycotoxin contamination.
<b>Guatemala</b> March 1992	<i>Program Planning with INCAP</i> SUSTAIN provided technical support to INCAP to help assess opportunities for INCAP to market services to the Central American food industry in areas such as product development, food safety, and quality assurance.
<b>Guatemala</b> Jan/Feb 1992	<i>Industrial Capacity Building Assessment</i> A SUSTAIN team conducted an assessment of INCAP's (Institute of Nutrition of Central America and Panama) institutional capacity to work with the private sector to address food & nutrition challenges.
<b>Nigeria</b> October 1991	<i>Weaning Foods Assessment</i> An assessment of manufacturing capability and market opportunity for low-cost weaning foods in Nigeria.

## APPENDIX B: SUSTAIN Publications from 1991-2000

Country/Date	Description
Washington, DC October 2000	<p style="text-align: center;"><b><i>Commodities Reference Guide – Part II</i></b></p> <p>SUSTAIN completed revisions of Part Two of the Commodities Reference Guide (CRG). The CRG provides information on food commodities distributed under Title II P.L. 480. The program is administered by USAID and implemented by PVOs. Part Two contains guidance on selecting food aid commodities for Title II programs and consists of Section V and VI. Section V consists of an overview of Food for Peace programs, general guidelines for program design and commodity selection, and key considerations for five Title II food aid programs. Section VI consists of the annexes for use in designing food aid programs and calculating ration packages. It is currently housed on the USAID web site at <a href="http://www.info.usaid.gov/hum_response/crg/">http://www.info.usaid.gov/hum_response/crg/</a></p>
Ghana September 2000	<p style="text-align: center;"><b><i>Activity Report on AMSEA’s Ghana Project</i></b></p> <p>SUSTAIN visited Ghana to finalize tomato processing activities there and to help transition support to ADRA’s post-harvest activities to CSIR/South Africa.</p>
Brazil . August 2000	<p style="text-align: center;"><b><i>Activity Report on Technical Assistance to Brazilian Milling Industry</i></b></p> <p>Technical assistance visit to provide technical support to a workshop for millers on fortification techniques and lessons learned from fortification initiatives in the United States and Latin America.</p>
Washington, DC August 2000	<p style="text-align: center;"><b><i>Report on Evaluation of Iron Compounds in Corn Masa Flour</i></b></p> <p>SUSTAIN commissioned a three-part study (<i>Storage, Sensory, and Bioavailability Evaluations</i>) to help identify an iron fortificant for use in corn masa flour that is absorbable by the body and which does not adversely affect the product. Ferrous sulfate and fumarate (with and without an iron absorption enhancer) and disodium-EDTA were evaluated. Ferrous fumarate had the best overall performance.</p>
Washington, DC April 2000	<p style="text-align: center;"><b><i>Article Published in FAM’s “Food Forum”</i></b></p> <p>A SUSTAIN article was featured in Food Aid Management’s “Food Forum” newsletter, which provided an explanation of newly issued USDA specifications for micronutrient fortification and quality assurance of PL 480 commodities. The article also described key results from SUSTAIN projects conducted in collaboration with USAID, USDA and the manufacturers with the goal of improving the micronutrient quality of food aid commodities.</p>

Country/Date	Description
Brazil March 2000	<b><i>Activity Report on Assessment of Brazilian Milling Industry</i></b> Assessment of corn and wheat millers' capabilities in iron fortification and planning for "mobilization" workshop on fortification issues.
Ghana February 2000	<b><i>Activity Report on AMSEA's Ghana Project</i></b> Project planning visit to Ghana to assist ADRA in the development of project activities that would strengthen local counterparts' and farmers' skills on marketing and post-harvest processing of staple crops. The SUSTAIN team recommended providing food processing technology for one or more of the crops that ADRA client farmers rely on most for income generation.
Bangladesh December 1999	<b><i>Activity Report on Bangladesh Fortification Assessment</i></b> SUSTAIN participated in an assessment of the micronutrient fortification of wheat atta (flour) in Bangladesh and the possible introduction of fortified atta into the Bangladesh government's Food for Education program.
Washington, DC November 1999	<b><i>SUSTAIN Featured in "Today's Dietician", November 1999</i></b> A four-page article appeared in the November 1999 issue of "Today's Dietician" describing SUSTAIN's unique approach to improving the nutrient content, safety and quality of food aid commodities through the application of food technology. SUSTAIN's reliance on expert volunteers was emphasized.
Washington, DC September 1999	<b><i>Final Report on the Micronutrient Assessment Project (MAP)</i></b> The MAP study assessed the content and quality of micronutrients in U.S. PL 480 commodities and offered recommendations to improve the diets of food aid recipients. The Final Report includes findings, recommendations, and accomplishments of the MAP study. The publication was distributed to government agencies, PVOs, food manufacturers, and academia.
Washington, DC August 1999	<b><i>SUSTAIN Notes</i></b> SUSTAIN published its yearly newsletter, which provided a concise update of project activities.
Washington, DC March 1999	<b><i>Commodities Reference Guide (CRG) – Part 1</i></b> SUSTAIN revised Part One of the CRG by updating the list of food aid commodities to those currently distributed under the Title II program, as well as expanding information on the commodities to include micronutrient, storage, and other specifications. It is currently housed on the USAID web site at <a href="http://www.info.usaid.gov/hum_response/crg/">http://www.info.usaid.gov/hum_response/crg/</a>

Appendix B- SUSTAIN Publications

Country/Date	Description
Washington, DC February 1999	<p style="text-align: center;"><b><i>IFT Iron Forum Proceedings Report</i></b></p> <p>In February of 1999, SUSTAIN published and distributed the proceedings from its Forum on Iron Fortification held at the 1998 IFT Annual Meeting. Because of the importance of the topic and the high quality of the presentations, SUSTAIN published this special report with the intent of increasing the awareness of the issue. The report was widely distributed among academia, industry, government and the public health sector.</p>
Stuttgart, AR September 1998	<p style="text-align: center;"><b><i>Proceedings: Workshop on Micronutrient Enhancement of Rice</i></b></p> <p>A SUSTAIN fortification specialist participated in a workshop to discuss opportunities and constraints of currently available rice fortification and enhancement technologies to address micronutrient deficiencies in developing countries. SUSTAIN sponsored the writing and publication of the workshop proceedings.</p>
Guatemala September 1998	<p style="text-align: center;"><b><i>Activity Report on Technical Assistance to 1998 AGTA Conference</i></b></p> <p>SUSTAIN volunteers provided technical support to the 1998 Congress of Guatemalan Association of Food Technologists (AGTA).</p>
Washington, DC August 1998	<p style="text-align: center;"><b><i>SUSTAIN Report on Vitamin A in Vegetable Oil</i></b></p> <p>As a follow-up to MAP, USAID asked SUSTAIN to assess the feasibility of adding vitamin A to vegetable oil. A report entitled "Vitamin A Fortification of PL 480 Vegetable Oil" focuses on the findings from the assessment and recommends to FFP to fortify PL 480 vegetable oil with vitamin A.</p>
Beirut, Lebanon July 1998	<p style="text-align: center;"><b><i>Activity Report: Workshop on Flour Fortification in the Middle East and North Africa</i></b></p> <p>A SUSTAIN industry specialist participated in a regional workshop on iron deficiency and the resulting health and economic implications of iron fortification in the Middle East. A number of recommendations were made by the SUSTAIN expert concerning possible opportunities for SUSTAIN to supplement the work of international PVOs and international development organizations.</p>
Russia June-July 1998	<p style="text-align: center;"><b><i>Activity Report on Russia Flour Enrichment Assessment Visit</i></b></p> <p>Assessment visit to Russia to explore the feasibility of implementing Russian fortification programs in iron, iodine, selenium, and flouride. Report was distributed to stakeholders and interested parties including individuals from CDC, USAID, USDA and the Russian Institute of Nutrition.</p>

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Country/Date	Description
San Pedro Sula, Honduras February 1998	<p align="center"><b><i>Activity Report on Food Safety Workshops - Part II: Food Plant Sanitation and GMPs</i></b></p> <p>SUSTAIN Volunteers conducted a workshop on Good Manufacturing Policies (GMP) and sanitation and hygiene in the food plant. Topics included microbiology of the food plant, hygienic consideration of equipment and facility design, employee practices and food plant sanitation, pest control, and quality control.</p>
Tegucigalpa, Honduras November 1997	<p align="center"><b><i>Activity Report on Food Safety Workshops - Part I: HACCP</i></b></p> <p>SUSTAIN Volunteers conducted a workshop on hazard analysis, critical control points (HACCP) monitoring and verification. Applied learning through practical exercises was emphasized, allowing participants to develop their own plans for setting up a HACCP plan.</p>
Arusha, Tanzania November 1997	<p align="center"><b><i>Activity Report on Eastern and Southern Africa Regional Consultation on Anemia</i></b></p> <p>SUSTAIN participated in an African Consultation on Anemia, sponsored by UNICEF and the Micronutrient Initiative, and spoke on food fortification as one of several possible methods for combating anemia.</p>
West Lafayette, Indiana October 1997	<p align="center"><b><i>Activity Report on Participant Training: Purdue University Food Manufacturing Center Visit</i></b></p> <p>A SUSTAIN Volunteer arranged for a group of Guatemalans to visit Purdue University's Food Manufacturing Center to learn more about computerized automations and new technologies for canning.</p>
Washington, DC September 1997	<p align="center"><b><i>Results Report on the Vitamin C Pilot Program</i></b></p> <p>SUSTAIN conducted an evaluation on the performance of food aid commodities with increased levels of vitamin C. Findings from the study indicated the current amount of vitamin C in the blended foods was sufficient for the needs of the recipients and that with the highly labile nature of the product it would not be cost-effective to increase the amount of vitamin C in the commodities. Study results were submitted to NAS and incorporated into <i>Vitamin C Fortification in Food Aid Commodities</i>.</p>
Washington, DC August 1997	<p align="center"><b><i>SUSTAIN Notes</i></b></p> <p>Theme of this newsletter was "Volunteers Leading the Way", which included descriptions of recent project activities.</p>

Country/Date	Description
Russia June/July 1997	<p style="text-align: center;"><b><i>Activity Report on Moscow Micronutrient Workshop</i></b></p> <p>A SUSTAIN team participated in a consultative workshop organized by the U.S. and Russian governments to discuss public health problems associated with deficiencies of fluoride, iodine, selenium and iron in Russia. The meeting was organized under the auspices of the Gore-Chernomyrdin Commission's Health Committee.</p>
Nicaragua June 1997	<p style="text-align: center;"><b><i>Assessment of Soy Processing operation</i></b></p> <p>A SUSTAIN Volunteer provided technical assistance to a Nicaraguan company (GRACSA) to evaluate changes GRACSA would have to make to produce soy milk and other soy products for human consumption. The company currently produces soy products for animal feed.</p>
Guatemala May 1997	<p style="text-align: center;"><b><i>Activity Report on Seminar on Packaging – AGTA</i></b></p> <p>During this seminar, organized by the Guatemalan Association of Food Technologists (AGTA) , a SUSTAIN volunteer with expertise in packaging spoke on trends and technology in food and beverage packaging, which can aid nutrient retention and prevent food spoilage. The volunteer also provided technical assistance in packaging to four food processing companies.</p>
El Salvador Spring 1997	<p style="text-align: center;"><b><i>Activity Report: Workshops on Food Safety &amp; Quality Assurance – A Three Part Series</i></b></p> <p>Two SUSTAIN Volunteers from Silliker Laboratories Group conducted a three-part series of workshops on food safety and quality assurance systems in El Salvador. The objective of the workshop series was to train technical managers working in the Central American food industry on the principles of sanitation and hygiene in food plants, Good Manufacturing Practices, and Hazard Analysis Critical Control Points.</p> <ul style="list-style-type: none"> <li>➤ Workshop One covered topics including: microorganisms in food processing environments, hygienic considerations, cleaning and sanitizing.</li> <li>➤ Workshop Two covered topics including: food microbiology, Good Manufacturing Practices, pest control, and inspection systems.</li> <li>➤ Workshop Three covered topics including: the seven principles of Hazard Analysis Critical Control Points (HACCP).</li> </ul>

Country/Date	Description
Mexico March 1997	<p style="text-align: center;"><b><i>Activity Report on Pan-American 1997 Meeting in Mexico</i></b></p> <p>A SUSTAIN fortification specialists spoke at a conference on fortification efforts underway in Latin America to help reduce iron deficiency anemia.</p>
Honduras and Nicaragua Aug./Sept. 1996	<p style="text-align: center;"><b><i>Activity Report on Food Safety Assessment of Meat Processing Plants</i></b></p> <p>A SUSTAIN volunteer assessed the Honduran meat industry's need for technical assistance with particular reference to recent regulations issued by the USDA that would mandate HACCP systems for all U.S. meat plants, as well as non-U.S. plants that want to export meat to the U.S. An assessment of a slaughter and packaging operation in Nicaragua was also made at the request of CARNIC, a Nicaraguan slaughter and packaging operation. This report includes recommendations on options for automation, by-product utilization, and systems to reduce the costs of production.</p>
Russia (Voronezh) July/Aug 1996	<p style="text-align: center;"><b><i>Feasibility of Starting Juice Processing Facility</i></b></p> <p>Assessment of the feasibility of a dairy products plant of starting and operating a juice processing facility for fruit juice products, a natural source of vitamins, to be marketed in northwestern Russia.</p>
Guatemala April 1996	<p style="text-align: center;"><b><i>Activity Report on Congress of Guatemalan Association of Food Technologists</i></b></p> <p>Two SUSTAIN volunteers participated in a biannual congress of the Guatemalan Association of Food Technologists (AGTA). A volunteer from Nabisco gave a presentation on "Technological Trends in the Food Industry" and a volunteer from the U.K.-based International Food Information Service (IFIS) gave a presentation on "Information Systems for Food Technologists".</p>
India, the Philippines, and Indonesia March 1996	<p style="text-align: center;"><b><i>Activity Report on Seafood HACCP Training</i></b></p> <p>Two SUSTAIN volunteers participated in a series of workshops on HACCP quality assurance requirements for seafood products that were held in March 1996 in Cochin (India), Jakarta (Indonesia), and Manila (The Philippines).</p>
El Salvador March 1996	<p style="text-align: center;"><b><i>Activity Report on Cheese Processing Training</i></b></p> <p>A SUSTAIN volunteer provided training in general and specialty cheese processing technologies, with emphasis on goat cheese, at a workshop organized by the National Agriculture School (ENA) of El Salvador.</p>

Appendix B- SUSTAIN Publications

Country/Date	Description
El Salvador February 1996	<b><i>Activity on Organic Coffee Processing III Technical Assistance</i></b> Third in a series of three technical assistance visits to UCRAPROBEX, a coffee growers' cooperative that produces and exports about 12% of the coffee in El Salvador. On this visit, the volunteer advised on the kind of roasting, grinding and packaging technologies needed to expand the manufacture and sale of organic coffee beyond El Salvador to other Central American countries.
Guatemala December 1995	<b><i>Activity Report on Fruits &amp; Vegetables Processing Training</i></b> A SUSTAIN volunteer trained PROFRUTA technicians in the processing of fruits and vegetables, a natural source of vitamins and minerals, in Guatemala.
Ohio/PA November 1995	<b><i>Visit of Russian Dairy Personnel to U.S. Facilities</i></b> A SUSTAIN volunteer from a dairy plant in Pennsylvania hosted two technicians from Russian dairy plants on a tour of U.S. dairy and packaging plants in Ohio and Pennsylvania.
Guatemala and El Salvador September 1995	<b><i>Activity Report on Assessment of Food Safety &amp; Quality Assurance Training</i></b> An assessment of previous SUSTAIN workshops in food safety and quality assurance was conducted. Input from private and public sectors was gathered to design future training series in food hygiene, plant sanitation, Good Manufacturing Practices, quality assurance, & HACCP.
Guatemala Sept 1995	<b><i>Activity Report on INCAP Anniversary Conference</i></b> Presentation on "Globalizing Trade & Nutrition: Enhancing Diets of Central American Populations".
Russia (Tver Oblast) September 1995	<b><i>Activity Report on Dairy Processing II Training</i></b> This is the second of two workshops on dairy product processing, production, packaging, and marketing conducted by a SUSTAIN volunteer. The volunteer also provided further technical assistance to dairy processors.
Honduras August 1995	<b><i>Activity Report on Fruits &amp; Vegetables Processing Training</i></b> Conducted workshop on fruit and vegetable processing technologies, including instruction on preservation techniques, quality control, and canning regulations for plant managers and technicians. Training was conducted at the request of the Chamber of Commerce of Northern Honduras for employees of local food processing operations.

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Country/Date	Description
Russia June 1995	<b><i>Activity Report on Marketing Training</i></b> Two SUSTAIN Volunteers provided training on the fundamentals of marketing for small and newly-privatized food manufacturing businesses in Russia. Subjects covered included consumer trend analysis, packaging, pricing, advertising, and promotion
Washington, DC Anaheim, CA May/June 1995	<b><i>Activity Report on Participant Training - Uganda &amp; Madagascar</i></b> USAID/AFR/PSG&E and SUSTAIN hosted the Director of the Ugandan Bureau of Standards and the Manager of AFAFI, a company in Madagascar, at the 1995 Annual Meeting of the Institute of Food Technologists and visits to Washington, DC.
Indonesia May 1995	<b><i>Activity Report on Organic Coffee Technical Assistance</i></b> A SUSTAIN Volunteer provided technical assistance in roasting, grinding, packaging, and equipment needs for processing, marketing, and distribution of organic coffee to a coffee cooperative in Indonesia.
Guatemala March 1995	<b><i>Bakery Technologies &amp; Quality Control II Training</i></b> A SUSTAIN Volunteer provided training in baking and quality assurance technologies to personnel from bakery plants and mills in Guatemala. Subjects covered included ingredient functionality, equipment and plant maintenance, and quality control for product quality and safety.
Washington, DC February 1995	<b><i>SUSTAIN Notes</i></b> Volume 7, No. 1 was entitled HACCP: A Design for Food Safety and focused on related to hazard analysis critical control points (HACCP) for food plants.
Russia Jan/Feb 1995	<b><i>Activity Report on Dairy Product Development I Training</i></b> First in a pair of workshop and technical assistance activities in dairy product development, diversification, and quality control.
Nepal Jan/Feb 1995	<b><i>Activity Report on Assessment of Dairy Processing in Nepal</i></b> A SUSTAIN Volunteer conducted an assessment of options for dairy farmers and small dairy plants to improve milk quality, diversify processing technologies, and improve packaging, storage, and handling practices in Nepal.

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Country/Date	Description
<b>El Salvador</b> January 1995	<p style="text-align: center;"><b><i>Activity Report on Turnaround Assessment: Fisheries Cooperative Facility</i></b></p> Assessment of condition, value, and turnaround potential of fishing fleet and processing facility of a fishery cooperative.
<b>Guatemala</b> November 1994	<p style="text-align: center;"><b><i>Activity Report on Hazard Analysis Critical Control Points Training</i></b></p> Two SUSTAIN Volunteers conducted a short course on the Hazard Analysis Critical Control Point (HACCP) system for technical managers working in the Central American food industry.
<b>El Salvador</b> September 1994	<p style="text-align: center;"><b><i>Activity Report on Organic Coffee Processing II Technical Assistance</i></b></p> Second in a series of three. The SUSTAIN volunteer returned to El Salvador to provide technical assistance to a coffee cooperative that was producing an organic line of coffee, known as Pipil. Assistance was provided in roasting, grinding, packaging, equipment installation, and quality control.
<b>Zambia</b> September 1994	<p style="text-align: center;"><b><i>Essential Oils, Flavors, Spices, &amp; Natural Ingredients</i></b></p> USAID/AFR workshop where SUSTAIN volunteers presented information on preservation, packaging, marketing strategies, international quality specifications, small business development, and value-added products.
<b>Guatemala</b> August 1994	<p style="text-align: center;"><b><i>Activity Report on Marketing Seminar</i></b></p> Workshop on the fundamentals of marketing on a small budget, including consumer trend analysis, why new products fail, packaging, pricing, advertising, and promotion.
<b>Washington, DC</b> August 1994	<p style="text-align: center;"><b><i>SUSTAIN Notes</i></b></p> Volume 6, Number 1 entitled "The Food Industry's Role in Water Supply Management" focuses on issues related to water supply management in the food industry.
<b>Honduras</b> July 1994	<p style="text-align: center;"><b><i>Activity Report on Food Safety &amp; Quality Control Training</i></b></p> A team of SUSTAIN Volunteers conducted a workshop on good manufacturing practices, basic plant sanitation, and quality control for technical managers of food manufacturing plants in Honduras.

Country/Date	Description
Guatemala July 1994	<p style="text-align: center;"><b><i>Activity Report on Fruits &amp; Vegetables Processing Training</i></b></p> <p>Workshop offered with INCAP (Institute of Nutrition of Central America and Panama) on fruit and vegetable processing, including preservation techniques for maximum nutrient retention, quality control, and canning regulations, for plant managers, supervisors, and technicians.</p>
Indonesia July 1994	<p style="text-align: center;"><b><i>Activity Report on Flour Milling &amp; Fortification Assessment</i></b></p> <p>Technical assistance to a small company in Indonesia interested in constructing a mill for high-protein, low-ash bread flour. The host organization later started construction of the plant, and hired the volunteer to manage this operation.</p>
Guatemala April 1994	<p style="text-align: center;"><b><i>Activity Report on Sensory Evaluation Techniques III Training</i></b></p> <p>In collaboration with INCAP a SUSTAIN volunteer conducted the third in a series of three workshops for food professionals in Central America on the use of sensory evaluation techniques and the application of these techniques to the processes of product development and quality control.</p>
Guatemala April 1994	<p style="text-align: center;"><b><i>Activity Report on Congress of Guatemalan Association of Food Technologists</i></b></p> <p>A team of four SUSTAIN volunteers and one staff member participated in a conference organized by the Guatemalan Association of Food Technologists, and gave presentations on global food market trends, pesticide residue and export regulations, Hazard Analysis Critical Control Points (HACCP), and total quality management.</p>
Guatemala February 1994	<p style="text-align: center;"><b><i>Activity Report on Bakery Short Course</i></b></p> <p>As part of a training for bakers on functional properties of bakery ingredients and their effect on finished products, the SUSTAIN Volunteer conducted sessions on preventative equipment maintenance and sanitation as related to the baking industry and fortification of baked products.</p>
Burkina Faso January 1994	<p style="text-align: center;"><b><i>Activity Report on Potato Storage II Technical Assistance</i></b></p> <p>Second in a pair of activities, a SUSTAIN volunteer provided technical assistance to a potato growers' cooperative in the design and construction of a potato storage facility and evaluated options for dehydration or refrigeration of potato crops to avoid food spoilage. No additional follow-up work could be undertaken because the USAID mission closed out of Burkina Faso shortly after this activity's completion.</p>

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Country/Date	Description
Cameroon October 1993	<p style="text-align: center;"><b><i>Activity Report on Assessment of Agricultural Research &amp; Development Programs</i></b></p> <p>Two SUSTAIN Volunteers participated in an assessment of opportunities for reorganizing agriculture research and extension institutions in Cameroon to better address problems and needs of small and medium sized food businesses. No follow-up work could be undertaken because the USAID mission closed out of Cameroon shortly after the SUSTAIN assignment and instructed cooperating agencies to phase out all assistance activities.</p>
Washington, DC December 1993	<p style="text-align: center;"><b><i>SUSTAIN Notes</i></b></p> <p>Volume 5, Number 3 publication, entitled "A Primer on Cooking Extruders" provides a detailed description of the types of extruders, how they work, and cost considerations.</p>
El Salvador December 1993	<p style="text-align: center;"><b><i>Activity Report on Organic Coffee Processing I Technical Assistance</i></b></p> <p>First in a series of three. The SUSTAIN volunteer provided basic technical assistance to a coffee cooperative that was producing an organic line of coffee, known as Pipil. Assistance was provided in roasting, grinding, packaging, equipment installation, and quality control.</p>
Uganda November 1993	<p style="text-align: center;"><b><i>Activity Report on Marketing &amp; Quality Control Training</i></b></p> <p>Workshop on marketing food products, good manufacturing practices, and quality assurance.</p>
Guatemala November 1993	<p style="text-align: center;"><b><i>Activity Report on Sensory Evaluation II Training</i></b></p> <p>Second in a three-part workshop series on sensory evaluation, which applies laboratory techniques, statistics, and consumer focus panels to evaluate consumer acceptance and preference of food products.</p>
South Pacific November 1993	<p style="text-align: center;"><b><i>Activity on Organic Production &amp; Marketing</i></b></p> <p>A SUSTAIN Volunteer provided technical assistance on methods for organic crop production and marketing to a group of Samoan farmers, which ultimately was successful in growing and marketing organic vanilla.</p>

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Country/Date	Description
<b>Guatemala</b> October 1993	<p style="text-align: center;"><b><i>Activity Report on Food Safety &amp; Quality Control II</i></b></p> <p>Second in a pair of workshops on food safety and quality assurance. Three SUSTAIN volunteers conducted this training in conjunction with local instructors that were trained by SUSTAIN. This workshop covered subjects including sanitation, good manufacturing practices, and quality control as a means of reducing food-borne illness and disease and improving product quality.</p>
<b>Burkina Faso</b> August/Sept 1993	<p style="text-align: center;"><b><i>Activity Report on Potato Storage I Technical Assistance</i></b></p> <p>First in a pair of activities. The SUSTAIN volunteer offered technical assistance to a potato growers' cooperative in the design and construction of a potato storage facility to avoid food spoilage.</p>
<b>Burkina Faso</b> Aug/Sept 1993	<p style="text-align: center;"><b><i>Activity Report on Corn Milling Technical Assistance</i></b></p> <p>Advice on improvement of the quality of dry milled corn product at a state-owned flour mill and on how locally produced corn can be marketed and used.</p>
<b>Uganda</b> August 1993	<p style="text-align: center;"><b><i>Activity Report on Packaging Training</i></b></p> <p>Workshop and technical assistance to six food processors on packaging techniques to maximize nutrient retention and minimize losses due to spoilage. Presented in collaboration with the Uganda Manufacturers' Association.</p>
<b>Belize</b> August 1993	<p style="text-align: center;"><b><i>Activity Report on Assessment Mission to Belize</i></b></p> <p>A SUSTAIN team conducted an assessment of opportunities for developing microenterprise food businesses in Belize. The assessment was carried out in conjunction with the micro-enterprise division of the Inter-American Development Bank. No follow-up work could be undertaken because the USAID mission closed out of Belize shortly after the SUSTAIN assignment and instructed cooperating agencies to phase out assistance activities.</p>
<b>Guatemala</b> August 1993	<p style="text-align: center;"><b><i>Activity Report on Technical Assistance in Baking and Quality Assurance Technologies</i></b></p> <p>Assessment of process and quality control practices of local bakeries manufacturing a nutritionally fortified cookie, assess the commercial feasibility of a Vitamin A rich children's cereal, and identify training needs for local bakeries. Organized by INCAP (Institute of Nutrition of Central America and Panama).</p>



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Country/Date	Description
Guatemala August 1993	<b><i>Activity Report on Food Safety and Quality Assurance I Training</i></b> First in a pair of quality assurance workshops presented with INCAP and the Guatemalan Association of Food Technologists (AGTA). SUSTAIN volunteers provided instruction on good manufacturing practices, plant sanitation, and hygiene for line workers and technicians.
U.S. July 1993	<b><i>Activity Report on Participant Training</i></b> SUSTAIN sponsored a representative from the Uganda Manufacturers Association to participate in various training activities in the U.S. The training included participating in seminars on information management systems, attendance at the IFT Annual Meeting, and tours of U.S. food manufacturing plants.
Panama and Wisconsin, U.S. July 1993	<b><i>Activity Report on Waste Handling/Utilization in Slaughterhouses</i></b> Arranged for a group from Instituto Centroamericano de Investigacion y Tecnologia Industrial to observe and discuss methods of waste handling in slaughterhouses for purposes of pollution prevention and waste byproduct utilization.
Washington, DC July 1993	<b><i>SUSTAIN Notes</i></b> Volume 5, Number 2 entitled "New Product Development: The Lifeblood of Most Food Companies" covers major trends in consumer driven food systems, global food trends, and new product development stages. It also includes product development case histories.
Philippines May 1993	<b><i>Activity Report on Agricultural Products Quality Workshop</i></b> Delivery of technical presentations on organic marketing and certification requirements, food safety and quality assurance, fisheries, and spices and flour technologies.
Russia May 1993	<b><i>Activity Report on Technical Assessment Visit</i></b> Assessment of needs for technical assistance and training in food processing and marketing in the Tver Oblast (administrative district) of Russia. This original assessment led to follow-up activities in the region

Country/Date	Description
Guatemala March/April 1993	<b><i>Activity Report on Food Safety and Quality Assurance Assessment</i></b> Assessment of food manufacturers' needs in quality assurance/control and GMP to determine the design for a series of workshops and criteria for trainee participation.
Guatemala March 1993	<b><i>Activity Report on Sensory Evaluation I Training</i></b> First in a three-part series for food industry professionals in Central America to train them in the correct use of sensory evaluation techniques and their application to product development and quality control.
Uganda March/April 1993	<b><i>Activity Report on Food Technology Assessment</i></b> Assessment of technical assistance and training needs of food industry in Uganda.
Washington, DC March 1993	<b><i>SUSTAIN Notes</i></b> Volume 5, Number 5 entitled "Edible Packaging" describes types and applications of edible films for food products.
Guatemala March 1993	<b><i>Activity Report on Food Industry Survey</i></b> Survey of local food processors to identify specific needs for technical assistance and training that could be addressed collaboratively by SUSTAIN, INCAP, and AGTA (Guatemalan Association of Food Technologists).
Barbados February 1993	<b><i>Activity Report on Turnaround Assessment: Fruit and Vegetable Processing Cooperative</i></b> Financial and business analysis of options for rejuvenating a now-defunct Barbados agro- processing cooperative.
Nepal December 1992	<b><i>Activity Report on Feasibility of Establishing Commercial Food Testing Laboratory</i></b> Assessment of the feasibility of establishing a private food testing laboratory to address food safety concerns and help increase the competitiveness of Nepali food products in international trade.
Hungary November 1992	<b><i>Activity Report on Incubator Feasibility Assessment II</i></b> Second in a pair of assessments of the feasibility of developing a center for technology commercialization and agribusiness innovation in Hungary.

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Country/Date	Description
Washington, DC Oct/Nov 1992	<b><i>SUSTAIN Notes</i></b> Volume 4, Number 4 entitled "organic Foods—Market Trends and Definition describes the growing market for organic produce, and provides information about organic certification.
Guatemala September 1992	<b><i>Activity Report on INCAP 40<sup>th</sup> Anniversary Conference</i></b> SUSTAIN volunteers made presentations on product development, marketing, food fortification, and quality assurance in addressing food & nutritional needs at a conference hosted by INCAP.
Hungary August 1992	<b><i>Activity Report on Incubator Feasibility Assessment I</i></b> First in a pair of assessments of the feasibility of developing a center for technology commercialization and agribusiness innovation in Hungary.
Guatemala and Honduras July/Aug 1992	<b><i>Activity Report on Extrusion and Flavor Technologies</i></b> Workshop and technical assistance in the application of extrusion and flavor technologies.
Guatemala July 1992	<b><i>Activity Report on Pilot Plant Assessment</i></b> Assessment of INCAP's pilot plant building and equipment and recommendations for improvement.
Mexico July 1992	<b><i>Activity Report on Technical Assistance in Production of Goat Cheese</i></b> Technical assistance in processes for small-scale production of goat cheese. Topics covered included: equipment sanitation, pasteurization, and small-scale cheese processing technologies
Washington, DC June/July 1992	<b><i>SUSTAIN Notes</i></b> The Volume 4, Number 3 publication of SUSTAIN Notes focuses on food labeling issues.
Illinois June 1992	<b><i>Activity Report on Participant Training Support</i></b> A professor of food science from a Ugandan University participated in a short-course on soybean processing at INTSOY, University of Illinois
Honduras June 1992	<b><i>Activity Report on Technical Assistance: GMP and Pickling</i></b> Technical assistance to local company in Honduras on pickling technologies for vegetables, quality assurance and Good Manufacturing Practices.

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<b>Country/Date</b>	<b>Description</b>
Guatemala May 1992	<b><i>Activity Report on Organic Marketing Workshop</i></b> Seminar on the production and marketing of organic food products.
Guatemala April 1992	<b><i>Activity Report on Seminar on Mycotoxins</i></b> Seminar on low-cost technologies to detect and prevent mycotoxin contamination
Washington, DC March/April 1992	<b><i>SUSTAIN Notes</i></b> Volume 4, Number 2 includes articles about Project SUSTAIN, issues in microbiological food safety.
Guatemala Jan & March 1992	<b><i>Activity Report on Program Planning with INCAP</i></b> Assessment of INCAP's (Institute of Nutrition of Central America and Panama) institutional capacity to provide technical services and support to the food industry to address food & nutrition challenges.
Nigeria October 1991	<b><i>Activity Report on Low-Cost Weaning Foods Assessment</i></b> Assessment of manufacturing capability and market opportunity for low-cost weaning foods in Nigeria.

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