

STDF PROJECT PREPARATION GRANT (PPG)

APPLICATION FORM

The Standards and Trade Development Facility (STDF) provides grants (up to a maximum of US\$30,000) to assist eligible organizations in developing countries to develop full proposals for projects seeking to: (i) enhance capacity to meet official or commercial requirements in the sanitary and phytosanitary field and so facilitate market access; and (ii) better protect human and animal health and plants against disease and pest hazards related to cross border trade.

Complete details on eligibility criteria and other requirements are available in the *Guidance Note for Applicants* on the STDF website (www.standardsfacility.org). Please read the *Guidance Note* before completing this form.

This form should be completed by eligible organizations interested in applying for STDF funding to develop a project proposal. It is designed to provide the STDF Working Group, which makes decisions on STDF funding, with an overview about the project you wish to develop. This form should be completed in English, French or Spanish.

PPG Title	Establishment of a Regional Food Inspectors School in Central America
Budget requested from STDF	US\$30,000
Full name and contact details of the requesting organization(s)	Inter American Institute for Cooperation on Agriculture (IICA) Apdo. Postal 55-2200 , San Jose Vazquez de Coronado San Isidro 11101 Costa Rica
Full name and contact details of contact person for follow-up	Dr. Ricardo Molins Head, Agricultural Health and Food Safety Tel. (506) 2216-0184 Fax (506) 2216-0221 E-mail: Ricardo.Molins@iica.int

I. Background and rationale

1. Provide an overview of the SPS situation and issues in the country or region, as appropriate. This should include a description of any SPS priorities or issues identified in the Integrated Framework's Diagnostic Trade Integration Study (DTIS), SPS-related capacity evaluations, national development strategies or policies, or other relevant documents. It should also describe

the institutional framework for SPS management (see Qn. 7. A-C of the *Guidance Note* for further information).

The Regional Economic Integration Process and the Central American Agricultural Policy (PACA):

Central America is going through a very special time period, working to integrate itself into the world economy as a means of promoting a sustainable economic and social development. For the past two decades, the region has intensified a series of political, social and economic changes that have had a significant impact on the agricultural sector and have brought up new challenges and opportunities.

Thus, Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua are engaged in a process leading towards a Central American Customs Union (UAC for its name in Spanish). More recently, Panama initiated its incorporation into the Central American Economic Integration process, and the region adopted a common Central American Agricultural Policy (PACA) in December 2007. In addition, free trade agreements have been negotiated and signed with the region's most important trade partners, among them the United States and the European Union.

The countries in the region undertook implementation of the PACA since 2008, with the support of the Central American Economic Integration Secretariat (SIECA), the Secretariat of the Central American Agricultural Council (SECAC), the Executive Secretariat of the Central American Agricultural Council (SECAC), and the Inter American Institute for Cooperation on Agriculture (IICA).

At the customs union level (UAC), the Central American countries are developing Central American Technical Regulations that are mandatory. Some of these regulations in the area of food safety are the following: Good Manufacturing Practices (GMPs) for processed foods; microbiological criteria for foods and feeds; and GMPs for non-processed foods (in development).

Acting together has given countries in the region the capacity to better address common challenges and make use of the advantages of integration, such as the construction of a regional market; the development of commercial strategies that can benefit from economies of scale; being more attractive to foreign investors; taking advantage of international cooperation; and strengthening the region's negotiating capacity.

The main challenge confronting the region's agricultural sector is to increase its competitiveness so as to be able to benefit from the favorable commercial environment resulting from trade liberalization and free trade agreements. The objective is to take advantage of greater commercial opportunities provided by external as well as the Central American markets.

SPS Priorities in the Region:

The integration processes described earlier also have brought up important sanitary and phytosanitary challenges—prioritized in the PACA as regional measures—in the competitiveness and agribusiness areas. These measures are: Modernization of peripheral quarantine posts; revision and harmonization of sanitary and phytosanitary regulations; creation or upgrading of certification systems; promoting the use of risk analysis; conclusion of equivalence agreements; development of capacities in official laboratories; establishment of pest and disease prevention, control and eradication programs; development and adoption of mechanisms for accreditation of third parties; and active participation in international SPS fora.

Such integration initiatives make it imperative to have harmonized food safety regulations as well as protocols for conducting risk management tasks, particularly food safety control and inspection procedures. Although much has been done regarding harmonization of regional norms and regulations on food safety, little has been achieved in terms of similar harmonization of food inspection procedures that are essential to facilitate intra- and extra-regional trade. Such extra-regional trade, in turn, depends more every day on the capacity of exporting countries to demonstrate a level of proficiency in food safety high enough to satisfy the requirements of ever more demanding importing countries and buyers, some of which are imposing their own standards. Inspection—as an intrinsic, critical and highly visible part of a nation's food safety control system—plays a major role in opening or barring market access for countries in the region.

In addition, the Central American region—including Panama, and, by association, the Dominican Republic—has a high incidence of foodborne diseases that very likely represent huge economic and social costs. These costs are very difficult to calculate or even estimate because national epidemiological surveillance systems are very weak or nonexistent, something that precludes an identification of the main etiological agents of foodborne disease. To a large extent, food safety in the region has not been a governmental priority in the past, and thus food inspection at the primary production level—the farm, ponds, collection and packing houses and the like—as well as at food

processing, preparation and serving establishments ranges from inefficient to useless and is almost always obsolete (i.e., based not on risk and process but on end-product sampling and cosmetic considerations). Decentralization of food inspection, in turn, has allowed personnel with little or no specific training in the fundamentals of food safety to be regional, city, town, village or customs inspectors.

In view of the above, the formation of food inspectors having a common, fundamental technical background in food science—sufficient to allow them to identify microbiological, chemical and physical foodborne risks so as to be able to conduct food inspection based on risk, as required by the Codex Alimentarius—and using procedures that are harmonized throughout the region, would greatly facilitate trade in agricultural food products and constitute a driver for change regarding the safety of foods for export as well as for internal consumption. Furthermore, a professional inspector cadre would constitute a driver for modernization of food safety controls, would enable the countries of the region to improve public health, would help further modernize their regulations and would contribute to achieve eventual recognition from trading partners concerning the region's intention and capacity to ensure the safety of its food exports.

The Central American SPS Institutional Set Up:

Central American countries address SPS issues mainly through their Ministries of Agriculture and of Public Health. However, there are often other public agencies—such as the Ministries of Industry and Commerce and other institutions that deal with foreign trade—involved in the promotion of food hygiene and safety, as well as Ministries of Economy and Trade interested in the issue of food safety because of their involvement in free-trade agreement negotiations.

The private sector also plays a very important role as part of the agricultural health and food safety establishment, particularly addressing issues related to diagnostic laboratories, academic formation, equipment calibration and, in some cases, certification.

It is important to point out that lately the Ministries of Agriculture of Central America are taking up new responsibilities in relation to food safety that traditionally had been managed by Public Health Ministries. In doing so, the Ministries of Agriculture have become the national sanitary authority recognized by trading partners, and it is they that conduct inspections and ensure the safety of food exports. However, in view of market growth

tendencies and ever increasing demands for control and surveillance in the area of food safety, some countries are also implementing accreditation of third party, private sector entities, to provide some of the services formerly handled exclusively by the public sector.

Costa Rica's SPS System:

Food safety in Costa Rica is a shared responsibility of the Agriculture and Health Ministries. The National Animal Health Service of the Ministry of Agriculture oversees the safety of all foods of animal origin, in addition to its responsibilities in the animal health area. The State Phytosanitary Service, in turn, is in charge of control of pesticide residues in fruits and vegetables. The safety of all foods for internal consumption, however, with the exception of those of animal origin, is the responsibility of the Ministry of Health. Food inspection for export is in the Ministry of Agriculture, whereas internally such inspection is decentralized and conducted by the municipalities. In addition, the Ministry of Economy, Industry and Commerce is entrusted with promoting improvements in the competitiveness of Costa Rican enterprises—particularly small- and medium-sized firms—and the National Quality System Law has appointed it as the national focal point for the Codex Alimentarius, whose Technical Secretariat it houses.

The Concept of a Virtual Regional Food Inspectors School

As envisioned at the current pre-project stage, the Regional Food Inspectors School would be based at a university in Costa Rica and would operate online as a virtual entity. Costa Rica has been chosen to host the school and lead the initiative because it recently adopted a comprehensive National Food Safety Policy, created an inter-institutional mechanism for coordinating food safety-related activities and programs throughout the public and private sectors, has a good academic infrastructure in the area of Food Science and Technology, and enthusiastically received the project idea at the highest political level.

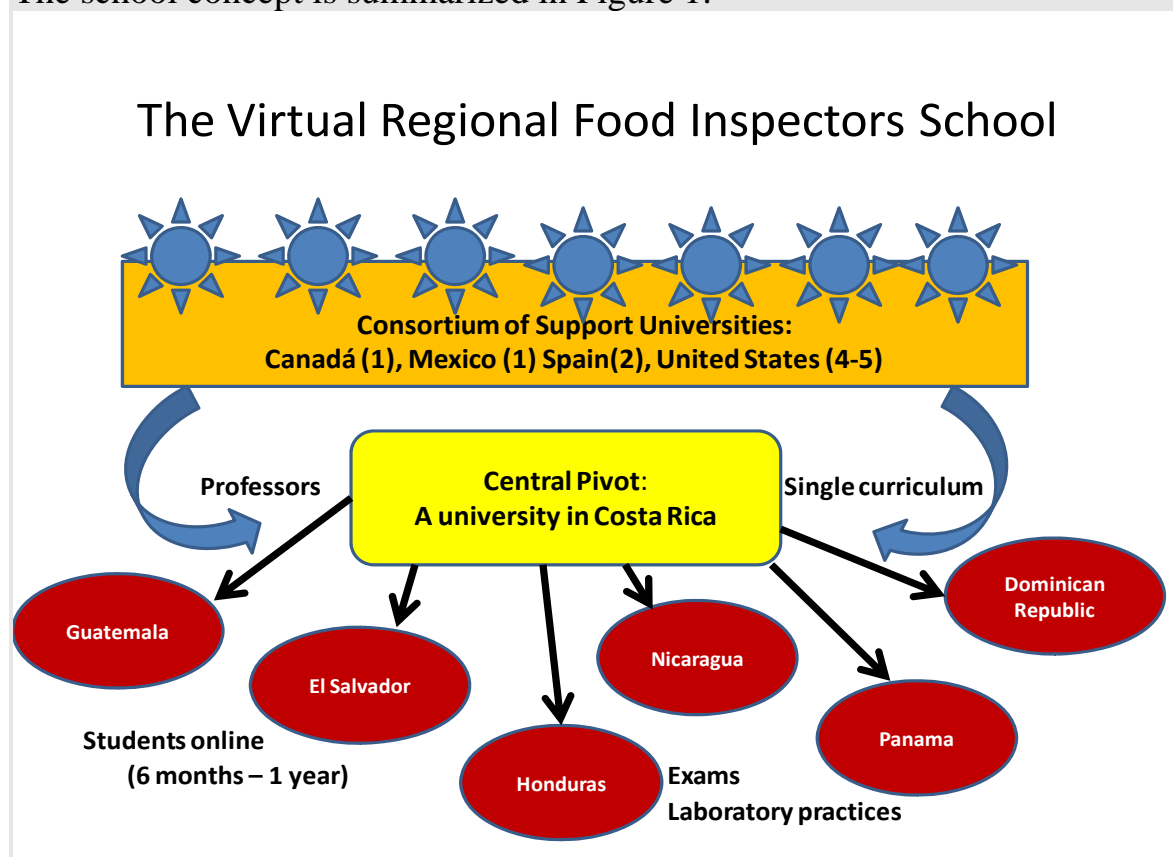
The school would operate online, offering a 6-month to one-year program of study leading to a Diploma on Food Inspection. Students could sign up, pay the fee themselves or through their institutions if they are public officials—it will likely be necessary to establish a fee to ensure program sustainability, the proceeds of which would be shared among all participating universities—and become accredited food inspectors upon graduation. There could be other universities in Costa Rica beside the one hosting the Regional Food Inspectors School, and at least one university in each of the other countries of the region, associated with the school. These peripheral universities would administrate the

program in their countries or regions, provide laboratory facilities for any required practical work, and administer exams originating at the school's see.

The study program, laboratory practices and exams would be the same throughout the region—thus leading to regional harmonization of food safety inspection protocols—and the diploma thus obtained would eventually be a sine-qua-non condition within the region for employment as a food inspector at any level or location (regional, national, municipal, customs, etc.). An initially generic food inspection curriculum could later be complemented with additional study courses for specialization (e.g., meat, seafood, etc., inspectors).

The initial curriculum will be designed with assistance from a Consortium of Universities from Canada, the United States, Mexico and Spain, so as to have the various regulatory and procedural outlooks and approaches from the region's main commercial partners. The Consortium would also help design and prepare the study material. In addition, the Consortium would provide a pool of instructors for initial (i.e., 2-year) delivery of courses and academic support for students and local faculty.

The school concept is summarized in Figure 1:



2. What key SPS problems and/or opportunities would this project preparation grant address? Explain the background to these problems/opportunities, their importance for the stakeholders concerned, particularly for market access and poverty reduction, and the expected benefits of developing a project in this area. See Qn. 7. D. of the *Guidance Note*.

Given the growth of intra- and extra-regional commerce in agricultural products, particularly food products, and future projections deriving from free-trade agreements negotiated by the region, it is becoming essential to strengthen food safety controls at origin so that compliance with international standards and norms and those of trading partners is ensured. The countries in Central America have been subjected to heavy pressures in the international food trade because of problems associated with food contaminants—as was the case for melons and raspberries—which had detrimental effects on the region's image as a supplier of wholesome food products.

On the other hand, internal pressures to provide effective protection for public health in the region are mounting. There are new demands for more controls on the safety of food imports and increased surveillance of foods in the domestic market because of the prevalence of foodborne diseases that have yet undetermined, but surely elevated, social and economic costs. Moreover, food contamination is increasingly being recognized in the region as a threat to food security. Therefore, harmonized food inspection protocols and training are essential to allow intra-regional commerce on foodstuffs as well.

In the above context, the present project intends to ensure an appropriate, high quality, homogeneous and permanent technical formation of food inspectors for the various institutions—public and private—involved in food safety assurance in all countries of the region, through a regional school for food inspectors. This formation will emphasize the application of standardized, modern food inspection techniques based on risk, as well as a uniform interpretation of the international standards and norms of the Codex Alimentarius and other regional and national regulations.

Strengthening the competence and skills of food inspectors will contribute to facilitate trade in food products through the recognition—within and outside the region—of the region's capacity and commitment to provide safe, wholesome food products to the market.

3. Which government agencies, private sector, academic or other organizations support this PPG request? Letters of support from each of these organizations must be attached (Appendix 1). See Qn. 7. E. of the *Guidance Note*.

This PPG is supported by three Ministries of the Costa Rican Government:

- Ministerio de Agricultura (Ministry of Agriculture)
- Ministerio de Economía, Industria y Comercio (Ministry of Economy, Industry and Commerce)
- Ministerio de Salud (Ministry of Health)

In addition, Costa Rican universities and technical institutes have been contacted and agreed to participate in the project.

Official letters of support are attached.

4. Are the activities to be carried out under this PPG related to any past, present or planned bilateral or multilateral donor projects and programmes? If so, identify the related activities below and explain how the PPG would complement and build on them. See Qn. 7. F. of the *Guidance Note*.

No, there are no related past, present or planned bilateral or multilateral projects or programs.

5. Have you discussed this PPG request – or funding for the project proposal which would result from it – with any potential donors (bilateral, multilateral, Enhanced Integrated Framework, etc.)? If so, provide information below and indicate any potential sources of funding for the project to be developed through this PPG. See Qn. 7. G. of the *Guidance Note*.

This PPG has not been discussed with any other potential funding entity or donor.

II. Implementation

6. What are the expected start and end dates for this PPG?

- The PPG would start as soon as it is approved and funded by the STDF - April 2011 is the initial target start date.
- The project will be developed during 2011 and will be ready for submission to the STDF on or before November 1, 2011.

7. What activities would be carried out under this PPG? Provide a description of each activity below, specifying the persons / offices responsible, as well as the completion dates and expected outputs.

Activity	Responsible	Completion date	Expected output
1. Present project idea to the Costa Rican Government to ensure its interest and agreement to host the virtual food inspectors school	IICA	Completed October 2011	Official expression of interest and support letters obtained
2. Constitute the Support Consortium of Universities	IICA	May 15, 2011	Consortium of 8 universities formed (Canada, Mexico, Spain, USA)
3. Ensure the adhesion of other regional countries (Dominican Republic, El Salvador,	IICA	July 15, 2011	Official expression of interest from governments

Guatemala, Honduras, Nicaragua, Panama) and their participating institutions and universities			and local universities
4. Conduct two meetings of the Consortium to define the modality and cost of operation of the virtual school	IICA/Consortium	Meeting 1: June 3, 2011 Meeting 2: August 31, 2011	Meeting 1: - Modality of operation of the school defined - Responsibility of members of the Consortium defined and accepted Meeting 2: - Curriculum agreed upon - Chronogram of study material preparation defined - School budget estimated - Full project document first draft available
5. Develop the academic curriculum for the future food inspectors.	IICA/Consortium	August 31, 2011	Draft curriculum available
7. Assign academic responsibilities to	Consortium	September 30, 2011	Draft agreement for

Consortium members (i.e., what university will take responsibility for preparing materials and teaching what courses)			Consortium responsibilities available
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8. List all the stakeholders (government, private sector, academia, etc.) that may have an interest in this PPG and the resultant project. Explain how will they be consulted and involved during the implementation of the PPG (e.g. interviews, validation workshops, etc.).

Food producers, industrial processors, importers and exporters would benefit through improved products, higher degree of competitiveness in and access to external and internal markets, and opening and/or preservation of markets. Secondly, society at large and regional governments would benefit via lower medical care and hospital expenditures on treatment for foodborne illnesses, increased productivity through less absenteeism due to foodborne diseases, and through the value of human lives saved and reduced sequelae from foodborne diseases. Finally and most importantly, the consumers of all regional countries and their commercial partners, via a healthier food supply.

- The Government of Costa Rica has expressed its interest through letters of support for the project from three Ministries (attached).
- The Governments of other Central American countries and Dominican Republic will be contacted as part of the pre-project activities.
- The universities and technical training institutes in Costa Rica have been contacted. There is interest from the Universidad de Costa Rica to become the host of the proposed school (letter of support attached), and of other universities and technical institutes in the country to participate as peripherals.
- The private sector will be contacted as part of the project development. It is expected that it will be receptive because the training program for food inspector would be open also to food processing supervisors much needed by industry and agribusinesses.
- Consumers will benefit the most from a safer food supply and it is anticipated that their representative associations will fully support the initiative.

9. Who will take the lead in the development of the project proposal under this PPG? If you propose national experts and/or international consultants for this task, provide their full name and contact details below. A Curriculum Vitae and record of achievements for each person proposed should be included in Appendix 2. If no names are provided, the STDF will provide a shortlist of consultants if the PPG request is approved.

Dr. Ricardo Molins

Head, Agricultural Health and Food Safety

IICA

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Costa Rica

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III. Budget

10. What is the total estimated budget (in US\$) required for this PPG? Specify the amount that is requested from the STDF and the in-kind contribution (if any). Complete the budget table below.

Item	Description of inputs required	Estimated budget (US\$)
Expertise <i>If used, include national or international consultants</i>		
Travel <i>If appropriate, include international flights for consultants (economy class), in-country travel, Daily Subsistence Allowance, etc.</i>	<ul style="list-style-type: none"> - Air tickets (2 meetings, 10 persons, \$1,000 ea.) - Per-diem (3-day meetings, \$1,320 ea.) - Taxes, taxis (\$140 ea.) - Insurance (\$138 ea.) - 4 promotion trips to countries, 2 persons (\$1,500/person/trip) 	<p>20,000</p> <p>13,200</p> <p>1,400</p> <p>1,380</p> <p>12,000</p>
Stakeholder meetings and workshops <i>If appropriate, include travel of participants, hire of venue, facilitator, etc.</i>	<ul style="list-style-type: none"> - Lunches and coffee breaks (\$300/day) - Transport (\$200 per meeting) - Translation (330/day) 	<p>1,800</p> <p>400</p> <p>1,980</p>
General operating expenses <i>If appropriate, include telephone calls, photocopying, etc.</i>	* IICA will absorb these expenses	
Other costs (describe)	<ul style="list-style-type: none"> - Unforeseen expenses - Administrative expenses (8%) 	<p>1,000</p> <p>4,253</p>
Total		US\$ 57,413
Requested from STDF		US\$30,000
IICA & Govt. Costa Rica	50% each	US\$27,413

Appendixes

Appendix 1: Letters of support from each of the organizations supporting this proposal.

Appendix 2: Curriculum Vitae and record of achievements for any consultants proposed to implement this PPG.

Curriculum Vitae

RICARDO MOLINS, Ph.D.

IICA, Apdo. 55-2200, San Jose, Vasquez de Coronado, San Isidro, Costa Rica

Tel.: (506) 2216-0184; Fax: (506) 2216-0173

E-mail: Ricardo.Molins@iica.int; Ricardo.molins@gmail.com

KEY QUALIFICATIONS

Expertise in food safety (microbiological and chemical) and quality and corresponding national and international regulations (Codex Alimentarius, USDA/FSIS, APHIS, and FDA regulations, OIE, IPPC and other international standards, particularly those on sanitary and phytosanitary SPS requirements), and policies. Ample international experience on assessment and modernization of national food safety control systems, veterinary and phytosanitary services, capacity building, policy and regulation development, and training for food control and foodborne hazard assessment and management (Hazard Analysis and Critical Control Points system – HACCP, Good Manufacturing Practices – GMP, Good Agricultural Practices – GAP, and Good Laboratory Practices – GLP). Expertise in food ingredients and additives. Multidisciplinary, multi-cultural team building and leading; national and international research project development and management. Experience in academic (research and teaching), extension (training), industrial (consulting, training, trouble shooting), non-profit, and public sector settings (technical assistance, laboratory services, training, policy and regulations).

EDUCATION

Ph.D. Food Technology (Minor in Economics) 1985, Iowa State University, Ames, Iowa

M.S. Food Technology, 1971 Iowa State University, Ames, Iowa

B.S. Food Technology, 1969 Iowa State University, Ames, Iowa

- Extension Services Training, 1973, UC Davis, U. Wisconsin - Madison

PROFESSIONAL EXPERIENCE

Interamerican Institute for Cooperation on Agriculture, IICA, San Jose, Costa Rica 2007-present

Head, Agricultural Health and Food Safety

- In charge of the hemispheric animal health, plant health, and food safety programs, in coordination with four Regional IICA Specialists and 34 IICA Latin America and Caribbean country offices.
- Contributing to develop national agricultural health and food safety policies and to modernize and strengthen national veterinary and phytosanitary services and food safety and quality control systems throughout the Americas.
- In charge of administrative and technical development, implementation and/or management of multiple, hemispheric or regional animal health, plant health, and food safety studies and projects.
- IICA's representative to all animal and plant health and food safety international organizations

and strategic allies such as Codex Alimentarius, OIE, IPPC, SPS Committee of the WTO, STDF Working Group.

- IICA's agricultural health and food safety team leader.

Private Consultant, Food Safety and Quality 2006

- Developed a new risk-based, process-oriented FAO Food Inspection Manual for use around the world.
- Evaluated three national food control systems (Kenya, Tanzania, and Uganda) and prepared 5-year action plans to modernize and strengthen the systems.
- Contributed to the development and pilot testing of the FAO guide for food control system verification (FAO, Rome, Italy).
- Consulted on food additives (particularly food phosphates), food irradiation, food ingredients, and food safety microbiology for various industries (USA).
- Evaluated the 2001-2005 worldwide food safety and quality capacity-building program of the Food and Agriculture Organization of the United Nations (FAO, Rome, Italy).

National Academy of Sciences, Institute of Medicine, Washington D.C.

Study Director, Food Chemicals Codex, and Senior Program Officer/Food Safety, Food and Nutrition Board 1999 - 2005

- Developed, organized, and managed National Academy of Sciences' multi-disciplinary, scientific food safety studies related to foodborne and environmental hazards, risk assessment, and proposals for risk management, commissioned by government agencies and the US Congress.
- Prepared proposals, procured funding, selected panel members, prepared report outlines, conducted meetings, edited and completed reports, briefed sponsors and congressional staff, and disseminated results of food safety scientific studies and other technical and policy studies.
- Study Director: development of specifications - "High-Energy Emergency Relief Ration" (2001)
- Co-Study Director: "Review of a USDA Draft Risk Assessment of *Escherichia coli* O157:H7 in Ground Beef" (2002)
- Study Director for the landmark NAS study on "Scientific Criteria to Ensure Safe Food" (2003).

As Study Director, Food Chemicals Codex (1999-2005), developed/revised chemical, physical, and microbiological purity/ identity standards and tests for food additives allowed in the U.S., liaised with government sponsors, and interacted with trade associations, industry, academia, and national/international regulatory agencies. Published the 5th Edition of the *Food Chemicals Codex*, two supplements to the 4th Edition, and the First Supplement to the 5th Edition. Represented the Institute of Medicine and the Food Chemicals Codex at national and international meetings, including Codex Alimentarius meetings. Contributed to the work of the Institute of Medicine's Roundtable on Environmental Health Sciences, Research, and Medicine.

International Atomic Energy Agency (IAEA), Food and Environmental Protection Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Vienna, Austria

Food Safety/Food Irradiation Specialist 1994 – 1999

- Contributed to the creation, structuring and start-up of the FAO/IAEA Training and Reference Center for Food and Pesticide Control.
- Provided capacity building assistance/training in the use of irradiation alone or combined with other treatments/hurdles to enhance the microbiological safety and quality of foods, prevent food losses, serve as quarantine treatment, ensure compliance with phytosanitary requirements and facilitate international trade in Latin American, Caribbean, African, and Middle Eastern countries.
- Coordinated scientific research programs, lectured on food irradiation, Hazard Analysis and Critical Control Points (HACCP) and other areas of food safety throughout the world.
- Monitored and advised 34 Research Contracts in Africa, the Middle East, Latin America, and Europe on control of foodborne hazards and food losses.
- Managed 3 multinational, multidisciplinary Technical Research Cooperation Programs, including a program on profiles of human bacterial pathogens in food entering international trade and

detection/identification methods in food microbiology.

- Implemented technical assistance projects involving food control/inspection systems, food microbiology laboratory installation, procedures (Good Laboratory Practices, Quality Assurance/Quality Control, HACCP), regulations development and methodology. Prepared and implemented national and regional food irradiation/food safety projects.
- Published research and position papers, delivered conferences and represented the IAEA and the Joint FAO/IAEA Division at international meetings, including Codex Alimentarius meetings.
- Implemented activities of the International Consultative Group on Food Irradiation (ICGFI).
- Contributed as a reviewer to the WHO/FAO HACCP Manual.

Salvadoran Foundation for Social and Economic Development (FUSADES), San Salvador, El Salvador

Director, Food Safety and Quality Assurance Laboratory and Program 1990 – 1994

Charged with planning, building, equipping, staffing, organizing, starting up, and managing the USAID-funded multidisciplinary, integrated agricultural (plant and animal health) and food safety/quality control “Laboratorio de Calidad Integral.”

- Provided contract analytical services to industry in pesticide and other residues, microbiological contaminants, food composition (including nutritional labeling - NLEA), and water quality.
- Provided contract food safety/quality analytical services to the Government of El Salvador’s food control authority, and trouble-shooting services to industry. Helped reorganize El Salvador’s food inspection/control system and create the National Codex Committee.
- Conducted training courses in Good Manufacturing Practices, food sanitation, food quality control, HACCP, post-harvest handling, and Good Agricultural Practices. Liaises with national and international organizations (FAO, WHO, USAID, EPA, FDA, USDA/FSIS, German GTZ). Procured fund, established programs and budgets, and participated in the Foundation’s operations committee. Directly supervised 32 food microbiologists, chemists, toxicologists, entomologists, biologists, food scientists, and support personnel.
- Brought the laboratory to financial self-sufficiency.

Concurrent, 1990-1994

Member, Board of Directors, National Council for Science and Technology (CONACYT) of El Salvador (Presidential appointment representing industry).

Chairman of El Salvador’s Codex Alimentarius Committee and Official Representative of El Salvador to the Codex Alimentarius Commission.

Consultant and lecturer on Hazard Analysis and Critical Control Points (HACCP) for the Food and Agriculture Organization of the United Nations (FAO) in Central America and Panama.

Iowa State University, Animal Science Department – Meat Export Research Center (MERC), and Food Technology Department, Ames, Iowa

Associate Professor, Tenured 1988 (earlier, Assistant Professor) 1985 - 1990

- Research appointment with graduate course teaching component in the Animal Science Department, Meat Export Research Center, and courtesy appointment in the Food Technology Department.
- In charge of the meat microbiology/safety and food irradiation programs. Research areas included application of physical methods for meat preservation and safety (e.g., temperature shock, high-intensity electrical pulses, modified atmospheres, irradiation); use and antimicrobial mode of action of food additives; development of rapid methods in food microbiology; meat preservation/shelf-life extension (modified-atmosphere packaging); development of new meat-based snack products.
- Founding member of the Iowa State University-University of Arkansas-Kansas State University Food Safety Consortium.

- Involved in planning and implementing the ISU Linear Accelerator Facility.
- Supervised and directed the research of 8 Ph.D. and 6 M.S. students, and 2 technicians.
- Authored one book and 35 refereed papers, many non-refereed articles and two patent applications, and presented numerous conferences at scientific events in the U.S. and Europe.
- Faculty advisor to various student campus organizations and academic counselor to troubled minority students.
- Member of the Editorial Boards of the *Journal of Food Science* (1987-89) and *Journal of Food Protection* (1989-90). Book reviewer, *Food Technology* (1989).
- Member, ASTM Tasks Group on Meat Irradiation and Dosimetry for Food Irradiation.
- Organized and chaired the Food Irradiation Symposium, Institute of Food Technologists (IFT) Annual Meeting, 1987.
- Expert Witness on Food Safety, U.S. Congress House of Representatives, 1987.
- Member, review panel, Science and Technology Centers Program, U.S. National Science Foundation (1988-89).
- Received numerous grants from industry and government sources that allowed full support of a research program in food microbiology involving simultaneously 7 Ph.D. and 5 M.S. students.

Concurrent, 1987-1990

Consultant to 3 Iowa food processors (animal protein derivatives, bagel manufacturing/shelf-life, and modified-atmosphere packaging, MAP) in microbiology/food safety areas, product development, and patent application.

Iowa State University, Food Technology Department, Ames, Iowa **Research Assistant/Ph.D. Student 1982 - 1985**

- Ph.D. candidate.
- Conducted graduate research work on the use of phosphates and other additives in meat preservation and for inhibition of pathogenic bacteria.
- Developed rapid method for determination of phosphate hydrolysis in muscle foods.
- Received the 1985 Iowa State University Research Excellence Award, and the 1985 Excellence in Food Science Award from the Iowa Section of the Institute of Food Technologists.
- Graduated in August, 1985 - Ph.D. in Food Technology, Minor in Economics.

United Nations Industrial Development Organization (UNIDO), Guatemala City, Guatemala **Food Technologist/Agroindustry Specialist and Coordinator 1978 - 1982**

- Coordinated UNIDO's technical assistance to the Guatemalan development bank (CORFINA) in food industry project development, from identification of investment opportunities to project profiles, techno-economic feasibility study, project promotion, plant layout, machinery selection and plant start-up.
- Evaluated 47 agro-industrial projects.
- Helped reorganize CORFINA's Industrial Projects Division.
- Prepared a 20-year development plan for Guatemala's food industry.
- Provided and directed technical assistance to local small- and medium-sized food processors in upgrading food product safety and quality, Good Manufacturing Practices, product adaptation for export, and modernization of processing lines (25 professional counterparts).

Desarrollo Trading Company, San Salvador, El Salvador **General Manager 1976 - 1978**

- Organized the company and its national/international industrial-commercial networks.
- Provided extension services and technical assistance to more than 50 local industries in reformulation and adaptation of food products to fit export market regulations and standards, particularly in areas of food quality and safety.

- Participated in official and food industry trade delegations.

Salvadoran Association of Exporters (COEXPORT)

Manager 1975 - 1978

- Organized the new association under the Salvadoran Chamber of Industry.
- Acted as liaison between the private industrial export sector and national and international trade organizations and agencies.
- Published the first Export Directory of El Salvador. Provided technical assistance to food industries in achieving product compliance with import requirements, in packaging for international markets and transport.
- Increased COEXPORT's membership from 13 to 115 members.

Central American Research Institute for Industry (ICAITI), Extension Services Section, Industrial Services Division, Guatemala City, Guatemala

Food Technologist, Head Extension Services 1972 – 1974

- Identified investment opportunities in agro-industry.
- Prepared agro-industrial profiles for pre-investment, pre-feasibility and full techno-economic feasibility studies, and food industry sector studies in Central America and the Caribbean.
- Provided technical assistance in processing plant modernization, assessment of food processing operations for quality and safety (fruits and vegetables, dairy, and meat industries) and in problem solving for meat and dairy industries.
- Trained in extension services at the University of California-Davis and University of Wisconsin-Madison, April-September, 1973.

Concurrent, 1973-74

Assistant Professor, Food Preservation and Packaging, Universidad Rafael Landívar, Guatemala City, Guatemala.

LANGUAGES: English, Spanish, working knowledge of French, Catalan.

MEMBERSHIPS: International Association for Food Protection (IAFP); Institute of Food Technologists (IFT); Sigma Xi - The Scientific Research Society; Gamma Sigma Delta - The Honor Society of Agriculture.

SERVICE: Editorial Board – *Journal of Food Protection*, 2003-present.
 Editorial Board, ComunIICA, IICA, Costa Rica, 2008-present.
 Reviewer, USDA/CSREES Small Business Research Initiative (SBRI), 2005.
 Grant review panel - USDA/CSREES SBRI, 2004.
 Member, Board of Directors, National Council for Science and Technology (CONACYT) of El Salvador (Presidential appointment), 1991-1994.
 Chairman of El Salvador's Codex Alimentarius Committee, 1991-1994.
 Official Representative of El Salvador to the Codex Alimentarius, 1992-1994.
 Rotary Club, San Salvador, 1992-1994.
 Expert Witness, Food Safety, U.S. Congress House of Representatives, 1987.
 Member, review panel, Science and Technology Centers Program, U.S. National Science Foundation, 1988-89.
 Book reviewer – *Food Technology*, 1989.
 Editorial Board – *Journal of Food Protection*, 1989-1990.
 Editorial Board – *Journal of Food Science* (1987-1989).
 Faculty Advisor, Latin American Students Club, and mentor for troubled minority students, Iowa State University, 1989-1990.

ASTM Tasks Groups: Meat Irradiation; Dosimetry for Food Irradiation, 1987-90.

Organizer and chair, IFT Food Irradiation Symposium, 1987.

Iowa State U., Animal Science and Food Technology Dept. committees, including food science curriculum review committee, 1985-1990.

AWARDS: 1985 Iowa State University Research Excellence Award; 1985 Excellence in Food Science Award, Iowa Section, Institute of Food Technologists (IFT). IICA Director General's Excellence Award 2006, 2009.

PUBLICATIONS: 48 peer-reviewed papers, 3 books, 3 book chapters, 7 National Academy of Sciences reports, 11 other publications, 28 abstracts and numerous lectures in 5 continents (list of publications available).

DR. RICARDO MOLINS

PUBLICATIONS

I. A. BOOKS

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- Molins, R.A. (Ed.). 2001. "*Food Irradiation Principles and Applications*." John Wiley & Sons, New York. ISBN 0-471-35634-4.
- Molins, R.A. (Ed.). 2003. (Translation) "*Irradiación de Alimentos - Principios y Aplicaciones*." Editorial Acribia, S.A. Zaragoza, España. ISBN 84-200-1020-0.

B. BOOK CHAPTERS

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- Molins, R.A. 2001. Global status of food irradiation in 2000. Ch. 17, *In Food Irradiation Principles and Applications*, Molins, R.A. (ed.). Wiley & Sons, New York.

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- Clostridium sporogenes* PA3679 and natural bacterial flora of cooked vacuum packaged bratwurst by sodium acid pyrophosphate and sodium tripolyphosphate with or without added sodium nitrite. J. Food Science 51: 726-730.
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- IOM. 2005. Review of NASA's Bioastronautics Roadmap. Institute of Medicine, The National Academies Press, Washington, D.C. (in press).

E. OTHER PUBLICATIONS

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- Situación y Perspectivas de la Agroindustria en Centroamérica. 1973. Instituto Centroamericano de Investigación y Tecnología Industrial (ICAITI), Guatemala (co-author).
- La Industria de Carne en Guatemala. Estudio Sectorial. 1974. Instituto Centroamericano de Investigación y Tecnología Industrial (ICAITI), Guatemala (co-author).
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- Boletín para Exportadores. 1975-1976. Vol. I-XVII. Comité de Exportadores de El Salvador (COEXPORT), San Salvador, El Salvador.
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F. ABSTRACTS

- Molins, R.A., Kraft, A.A., and Olson, D.G. 1984. Effect of phosphates on bacterial growth in media and refrigerated uncooked bratwurst. P. 68. Program 44th Annual Meeting IFT, Anaheim, CA.

- Molins, R.A., Kraft, A.A., and Olson, D.G. 1985. Effect of phosphates on bacterial growth in refrigerated uncooked bratwurst. P. 135. Program 45th Annual IFT Meeting, Atlanta, GA.
- Molins, R.A., Kraft, A.A., Walker, H.W., and Olson, D.G. 1985. Effect of poly- and pyrophosphates on the natural bacterial flora and inoculated *Clostridium sporogenes* PA3679 in cooked bratwurst. Program 45th Annual IFT Meeting, Atlanta, GA.
- Molins, R.A., Kraft, A.A., Walker, H.W., Rust, R.E., Olson, D.G., and Merkenich, K. 1986. Effect of inorganic polyphosphates on ground beef characteristics. P. 204. Program 46th Annual IFT Meeting, Dallas, TX.
- Marcy, J.A., Kraft, A.A., Hotchkiss, D.K., Molins, R.A., Olson, D.G., Walker, H.W., and White, P.J. 1986. Effect of acid and neutral pyrophosphate blends on the natural flora of a cooked meat system. P. 109. Program 47th Annual IFT Meeting, Las Vegas, NV.
- Molins, R.A., Sandoval, A.E., Olson, D.G., Rust, R.E., and Knipe, C.L. 1986. Microbiology of a ham-type product made from soy-extended cured beef and inoculated with *Clostridium sporogenes* PA3679. P. 110. Program 47th Annual IFT Meeting, Las Vegas, NV.
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- DeFreitas, Z. and Molins, R.A. 1990. Use of mechanically deboned pork in fermented meat spreads. P. 157. Program 50th Annual IFT Meeting, Anaheim, CA.
- Ammann, L.L., Sebranek, J.G., Manu-Tawiah, W., and Molins, R.A. 1990. Effects of a sodium erythorbate, phosphate and citric acid mixture for extension of color stability and shelf life of fresh meat. P. 157. Program 50th Annual IFT Meeting, Anaheim, CA.
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