



Annual Report 2006-2007

**The Joint Institute for Food Safety and
Applied Nutrition (JIFSAN)**

**University of Maryland
College Park, Maryland 20742**

Jianghong Meng, Interim Director

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Executive Summary

In 1996, the Joint Institute for Food Safety & Applied Nutrition (JIFSAN) at the University of Maryland, College Park was established by the University and the US Food & Drug Administration (FDA) to support cooperative research, education, and outreach programs that enhance the safety of our food supply, and to advance new concepts in public health, applied nutrition, and animal health. This report summarizes the activities and accomplishments of the fifth year of the 2nd five-year Cooperative Agreement (September 30, 2002 through September 30, 2007). The non-competitive base funding for the tenth year was \$775,200, with an additional \$1,355,016 in carry forward funds.

Over the past year, JIFSAN has experienced exciting developments as well as changes. Jianghong Meng, Acting Director of JIFSAN, provided an update to the CFSAN Management Council on JIFSAN's programs and activities on February 16, 2007. The Advisory Council met on April 11-12, 2007. The meeting involved brief presentations with updates on selected research and education/outreach programs, from JIFSAN, CFSAN and CVM. Discussions were held concerning JIFSAN's financial and business planning process. The council provided suggestions for how to further develop JIFSAN's programs to build upon its strengths.

The JIFSAN Student Internship Program continues to increase in importance and participation. UM undergraduate students are offered an opportunity to work with FDA scientists in their laboratories on specific projects identified by the FDA scientist involved. During 2006-2007, 26 UM students participated in research in FDA laboratories. Since its inception, over 200 individual students have participated in the internship program.

The Food Safety Risk Analysis Professional Development Program continued to develop and offer both face-to-face and distance learning online courses. The three-week Summer Integrated Program (SIP) was offered in June 2007 in Washington, D.C. SIP was well received, attracting 40 participants from 6 countries. It will be offered again in July 2008. Four online risk analysis courses were also offered to a total of 67 students from 11 countries. In July 2007, JIFSAN offered a customized risk analysis training program in 3 Latin American countries; Guatemala, Nicaragua, and Peru.

The Risk Analysis Clearinghouse online database was renamed to FoodRisk.org in November 2006. The database underwent a major upgrade including a new user interface and a new search engine for the database of food safety links. A design was launched in December 2007. Searches are faster, the results are presented in an easy to understand format, and users can sort the results in several different ways. The site continues to add unique information and data resources.

Support of the Center for Risk Communication Research (CRCR), led by the UM Department of Communication, is continuing with operation funding furnished by

JIFSAN for the fourth year. The CRCR serves as a focal point for scholarly activity and discussion related to risk communication.

JIFSAN expands its reach locally and globally through partnerships with federal agencies, national and international organizations, academic institutes, and the food industry. As a result, JIFSAN has strong international training programs supported by cooperative partnerships, and received a 2007 FDA Commissioner's Special Citation Award for its international food safety training efforts. One of JIFSAN's major programs is the Good Agricultural Practices (GAPs) international training program for the production of fresh produce with reduced microbiological contamination. This five-day program was offered in Guatemala, Peru and Nicaragua in 2007. JIFSAN has developed the Good Aquacultural Practices (GAQPs) Training program supported by a grant from JohnsonDiversey Cooperation, and offered a pilot program in Viet Nam in November 2006. A second program has been tentatively scheduled in Thailand in May 2008. Additionally, JIFSAN has formed an industry coalition to develop a Commercially Sterile Packaged Food (CSPF) training program. A draft training manual for CSPF has been developed. JIFSAN plans to offer a pilot program in November 2008. JIFSAN continues to develop partnerships with organizations dedicated to leadership in food safety and applied nutrition.

JIFSAN reaches a broad community by sponsoring or co-sponsoring and participating in workshops, conferences and seminars, promoting dialogue on food safety, applied nutrition and other public health issues. These programs are both domestic and international in scope. JIFSAN sponsored or co-sponsored four workshops/symposia this past year: The Tomato Safety Research Needs, sponsored by JIFSAN and the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), held February 21-22, 2007, in College Park, Maryland. The workshop brought together academia, industry, and government to discuss approaches and methodologies for comparing and prioritizing research needs for reducing food safety risk caused by pathogens in tomato. Tools for Prioritizing Food Safety Concerns, brought together different organizations who are working on tools for risk screening, ranking and prioritization to discuss approaches and develop recommendations for a process to prioritize risks associated with chemical and microbial contaminants in food. As part of a cooperative agreement with the Central Science Laboratory (CSL) in the U.K., The Eighth Joint CSL/JIFSAN Symposium on Food Safety and Nutrition was held at Greenbelt, Maryland on June 26-28, 2007. The topic was Nanotechnology in Foods and Cosmetics. The Global Chinese Health Food Symposium, July 27-28, 2007, in Chicago, was the first international conference held in the U.S. on Chinese Health Food and its associated concepts and technologies.

JIFSAN's research efforts are extensive and varied; investigating issues related to food safety, applied nutrition and other public health issues. Through activities in these program areas JIFSAN is able to reach out nationally and globally and continue playing a central role in creating knowledge for flexible solutions in a changing world. JIFSAN's Internal Research Program was discontinued, two years ago, due to lack of funding, and no new awards were made in the past year. However, plans are currently underway to

reinstate a modified version of this program, and several research projects are and will be funded by the renewed Cooperative Agreement in 2007-2008 and carry-forward funds.

Organization

Mission

Founded in 1996 by the University of Maryland and the US Food & Drug Administration, the Joint Institute for Food Safety & Applied Nutrition (JIFSAN) is a multidisciplinary research, education and outreach program. JIFSAN's mission is to support cooperative research, education, and outreach programs that enhance the safety of our food supply, and to advance new concepts in public health, applied nutrition, and animal health. JIFSAN has developed a vision towards achieving its goal as an internationally recognized source of reliable, science-based information on food safety, applied nutrition and animal health. Achievement of the mission and vision necessitate the active development of program-focused partnerships, with government agencies, industry, academia and public interest groups, including the acquisition of external funding.

Staff

Director	Dr. Jianghong Meng (Acting)
Associate Director	Dr. Paul Mazzocchi
Assistant to the Director	Ms. Vernora (Nora) Petty
Financial Officer	Ms. Mary Grimley
Conferences & Communications Coordinator	Ms. Judy Quigley
IT Programmer Analyst	Mr. Kyle McKillop
Accounting Associate	Ms. Beth McAllister
Internship Program Director	Dr. Kaci Thompson

JIFSAN Working Group

The JIFSAN Working Group is responsible for the operational policies and directions of the Institute. Meetings are held on a regularly scheduled basis (monthly) as schedules of the individuals involved permit. The Working Group is comprised of the representatives from both UM and FDA. This group discusses and advises the Director on policies, new initiatives, operating procedures, needs and opportunities for strengthening or expansion of existing programs and initiation of new programs/projects within JIFSAN. They are responsible for ensuring that none of these efforts is contrary to the mission and values of either UM or FDA.

Dr. Jianghong Meng (Chair), Acting Director, JIFSAN
Dr. Elizabeth M. Calvey, Associate Director, JIFSAN, representing FDA/CFSAN
Dr. Paul Mazzocchi, Associate Director, JIFSAN
Dr. Mickey Parish, Chair, the UM Department of Nutrition and Food Science
Dr. Renate Reimschuessel, representing FDA/CVM
David White (Alternate), representing FDA/CVM

The JIFSAN Advisory Council

Central to the operation of JIFSAN is the Advisory Council composed of 22 members from private sector business, government agencies, academia, and representatives of consumers' interests (See list of current members in Appendix A). This group provides guidance to JIFSAN in developing research, education, and outreach programs to address problems in food safety, nutrition, animal health sciences, and risk analysis.

The Advisory Council met on April 11-12, 2007. These meetings involved updates from JIFSAN, CFSAN and CVM. The Council learned about the latest improvements of the FoodRisk.org website, and the interactions between UM and FDA through JIFSAN including the student internship and collaborative research projects, and international outreach programs (e.g. GAPs and GAQPs). The meeting also provided an opportunity for JIFSAN to obtain Industry support for developing a Commercially Sterile Packaged Food (CSPF) training program. Discussions were held concerning JIFSAN's financial and business planning process and provided suggestions for how to further develop JIFSAN's programs to build upon its strengths.

Partners

A unique administrative structure of JIFSAN allows it to most effectively use resources while planning, organizing, and accomplishing multidisciplinary, multi-institutional programs in research, education, and outreach. JIFSAN has been utilizing, to the greatest extent possible, the administrative structures available in the University of Maryland as one of the major partners. The structure and policies of a major land-grant university offer the flexibility needed to enable JIFSAN to create and operate strategic alliances involving multiple partners and multiple funding sources. JIFSAN also expands its reach locally and globally through partnerships with federal agencies, national and international organizations, academic institutes, and the food industry. JIFSAN continues to develop partnerships with organizations dedicated to leadership in food safety and applied nutrition.

Federal Agencies

U.S. Food & Drug Administration (FDA)
U.S. Department of Agriculture (USDA)
U.S. Environmental Protection Agency (EPA)
U.S. Trade Representative (USTR)

Industry and Organizations

JohnsonDiversey
Campbell Soup
General Mills
Kraft Food
Grocery Manufacturers Association

International Partners

Australia: the Department of Natural Resources and Environment in Melbourne,
China: AQSIQ/CNCA

Korea: Food & Drug Administration
Thailand: Ministry of Science & Technology
Vietnam: Ministry of Fisheries
United Kingdom: Central Science Laboratory of the Department for Environment, Food, and Rural Affairs in York

Academic Institutes

National Center for Food Safety and Technology, Illinois Institute for Technology
University of Maryland at Baltimore
University of Maryland Eastern Shore
University of Maryland Center for Environmental Science
Clemson University
Cornell University
Mississippi State University
University of California--Davis
Virginia Polytechnic Institute

University of Maryland Partners

College of Agriculture and Natural Resources
College of Chemistry and Life Science
A. James Clark School of Engineering
College of Behavioral and Social Sciences
College of Computer, Mathematical and Physical Sciences
College of Arts and Humanities
Office of Professional Studies

Program Areas

JIFSAN conducts and supports activities in three broad program areas: research, education and outreach. The goal of JIFSAN's programs is to take multi-institutional, multidisciplinary approaches to address safety concerns and public health issues related to foods, cosmetics and animal health. An effective food safety system should be science-based, with a strong emphasis on risk analysis and prevention. Recognizing the importance of risk analysis in food safety, JIFSAN has developed and will continue to conduct research. Further, JIFSAN will continue to offer a series of professional development courses and training programs that are delivered in a variety of modes to improve the expertise of government, academia and industry personnel in risk analysis and to train food safety professionals from all over the world. Through activities in these program areas, JIFSAN is able to reach out nationally and globally and continue playing a central role in creating knowledge for flexible solutions in a changing world.

Research

JIFSAN's research efforts are extensive and varied; investigating issues related to food safety, applied nutrition and other public health issues at the local-regional level as well

as the international level (see Research Portfolio in Appendices). The JIFSAN research program was established to assist in the generation of new knowledge to support research efforts in furthering the scientific basis for public health policy formulation, evaluation, modeling and risk assessment. The applied research includes not only traditional laboratory and field research, but also educational, behavioral or social research, focused on defining the behavioral determinants that promote sound food safety practices.

Since 1998, JIFSAN has funded 47 research projects through its Internal Competitive Research Program (28 projects) and Collaborative/Cooperative Research Program (19 projects). In addition, 11 postdoctoral research projects have been funded. These funded projects have generated 97 publications as book chapters and research articles in major food safety, applied nutrition, and other public health journals, including the New England Journal of Medicine, Emerging Infectious Diseases, Antimicrobial Agents and Chemotherapy, Applied and Environmental Microbiology, Journal of Food Protection, Journal of Agriculture and Food Chemistry, Journal of Applied Social Psychology, Nutrition and Cancer, NeuroToxicology, and Investigative Ophthalmology & Visual Science. A total of 218 abstracts/presentations have been accepted in numerous national and international meetings, including 19 posters presented by UM undergraduate interns at FDA Science Forum. Many research articles have been repeatedly cited by other investigators and made important contributions to a better understanding of food safety and public health issues. The complete list of research projects, publications and presentations appears in Appendix A, JIFSAN Research Portfolio. JIFSAN plans to continue building a strong research program with a direct impact on the public health.

Collaborative research supports the goal to develop a strong science base to address ongoing and increasingly complex public food safety issues. This program was first initiated in 1998. Each project required collaboration between at least one UM faculty member as the Principal Investigator and one or more FDA collaborators. This collaboration helped to provide additional scientific expertise and insight into public health impacts of the research. The program allowed for additional collaborators outside UM and FDA. These projects contribute to the science for current and future regulatory issues and activities that impact on public health policies.

Due to budget reduction, currently no new Internal Competitive Research projects have been funded by the Cooperative Agreement. The last project was funded through July 07. The following research projects were funded from JIFSAN carry-forward funds and address priority food safety research needs identified by CFSAN.

- Analysis of sera from previous Norwalk-like virus human exposure study, Mark Sobsey, Department of Environmental Sciences and Engineering, University of North Carolina. (Project extended until 4/07)
- Enzymatic degradation of prion surrogate proteins, Jason C. H. Shih, Department of Poultry Science, North Carolina State University. (Continued through 12/07)

With the renewal of the third-five year cooperative agreement several new research initiatives that address public health needs were identified. Additionally, the WG decided to use carryover funds to support 1-2 larger research projects. An RFP will be developed identifying specific research questions that reflect the priority research needs of FDA that match with scientific expertise available at the University. Another goal of JIFSAN is to explore ways to expand its research program by developing partnerships with other organizations and the industry.

JIFSAN Postdoctoral Research Associate Program:

This program strengthens the science base for public health policy by providing short-term research opportunities for scientist within a regulatory environment. Between 2002 and 2007, nine postdoctoral research associates were recruited; working in FDA laboratories, in areas where significant knowledge gaps or the lack of appropriate scientific data, methods, or models existed.

This program has generated significant amounts of new knowledge, to promote the safety of the U.S. food supply. FDA has the important opportunity of evaluating the potential of these individuals to become productive staff members when vacancies exist. Two postdoctoral research associates were funded during the 2007 program year:

- Development of a Real-time PCR assay for the detection and identification of *Shigella* spp. from foods, Keith A. Lampel (FDA), Kwang-Young Song (JIFSAN Research Associate)
- *In Vitro* Skin Absorption of Nanoparticles: Robert Bronaugh (FDA); Srinivasa R. Raghavan (Chemical Engineering Department, UM); Oluwatosin Ogunsola (JIFSAN Research Associate)

Support of Center for Risk Communication Research:

JIFSAN continues providing funding in support of the Center for Risk Communication Research (CRCR) led by the UM Department of Communication. The Center's mission is to advance understanding about how communication helps control risk; the public perceives risk communication; and the political, economic and social contexts for risk communication. The Center's goals include helping to establish public and scholarly agendas for risk communication research, collaborating with other institutions and individuals to secure funding for research projects, and providing support for research and fellowships. The 2007 progress report of CRCR appears in Appendix B.

Leveraging:

The sharing of FDA-UM facilities represents additional opportunities to collaborative researchers through the JIFSAN program. Through JIFSAN, UM researchers and collaborators have access to UM facilities including: space and technical support for CFSAN nuclear magnetic resonance (NMR) and electron microscopy (EM) instrumentation within UM facilities, UM EM and NMR facilities, UM library facilities

(including online office access). The Instrumentation Service Centers established by UM and FDA/CFSAN on the UM Campus are staffed with technical personnel from FDA and the University and provide state-of-the-art services in NMR, light (confocal) microscopy, EM, and mass spectrometry. Through this development of core facilities, both partners have been able to significantly leverage available resources to provide for the purchase and maintenance of sensitive instrumentation needed for research.

Education

Education programs, with both domestic and international emphases, are of vital importance to JIFSAN. JIFSAN has developed and implemented innovative education and training programs in food safety and applied nutrition. Currently JIFSAN offers opportunities for both students and professionals through research internship program and training courses. The JIFSAN education programs have provided domestic and international food safety professionals tools and techniques of risk analysis to assure that food products are wholesome and safe for consumption.

JIFSAN Student Internship Program:

The JIFSAN Student Internship program is a unique undergraduate research program designed to provide UM undergraduate students with an opportunity to collaborate with FDA scientists on specific research projects related to the JIFSAN mission. These research opportunities enhance the students' knowledge of and experience in science, particularly in a regulatory environment, and familiarize them with career opportunities in the regulatory sector of public service.

Students' participation in the program requires that they have completed two college semesters, be willing to commit to volunteering 100 hours during the first term as an intern, and submit a completed application form, current transcript and resume. The positions may be part-time during the semester and full-time during the summer. Undergraduate students volunteer to work on a research project, listed by an FDA staff member. Upon successful completion of the initial 100-hour period, students can be converted to paid internships. During all phases of the internship, the students have a variety of ways to obtain academic credit for their internship experience.

A total of 227 UM students have participated in this program since its inception. In 2006-2007, 26 individual students participated in the program. Efforts continue to be made to extend these research opportunities for internships beyond laboratory experiences. UM Students are encouraged to co-author posters for presentation at FDA Science Forum and UM Bioscience Day. Several students have contributed to articles and research presentations with their FDA mentors.

The JIFSAN Internship Program is managed by Dr. Kaci Thompson, Director of Undergraduate Research and Internship Programs for the College of Chemical and Life Sciences. Student, faculty, and staff awareness of the Program is achieved through web postings, brochures, seminar series, campus list serves and the annual Internship Day.

Food Safety Risk Analysis Professional Development Training Program:

This program provides trainings in the key components of risk analysis. It has been developed and taught by FDA staff, UM faculty, and private consultants. Courses in the program are available in face-to-face as a summer integrated program [SIP] and as individual customized programs tailored for specific audiences and on-line distance learning formats. SIP places courses in a three-week format. There was a major and successful change in location from College Park to Washington DC, which resulted in significant decreases in facility costs and other expenses, as well as providing participants all of the advantages of an urban location for non-class times.

Summer Integrated Program (SIP):

Four Core courses including Overview of Risk Analysis; Food Safety Risk Management; Food Safety Risk Assessment; and Food Safety Risk Communication and two Intermediate courses in Quantitative Risk Assessment Methods: Model Building and Quantitative Risk Assessment Methods: Probabilistic Methods are taught in the Summer Integrated Program.

The face-to-face and SIP programs have offered over 1,000 class seats, and trained 584 individuals since 2002 (Table 1). Fifty one individuals enrolled in the courses in 2006, for a total of 113 class seats. Of these 51 individuals, approximately 20% were international government individuals representing 7 countries including Australia, China, Italy, Malaysia, Norway, South Korea, and Taiwan. Thirty-five percent represented the U.S. FDA, 15% represented other U.S. government agencies, and 15% were from the industry.

The 2007 SIP program was held in June 2007. Forty individuals enrolled and attended the courses, for a total of 127 class seats including 82 international seats. The international participants were from Canada, China, New Zealand, Norway, South Korea, and Spain.

Table 1. Summary of Food Safety Risk Analysis Summer Integrated Program (2002 to 2007)

Year	No. Courses	No. Course Registrations	No. Intl. Class Seats	No. Participants	Countries
2002*	12	275	2	173	Australia, China
2003*	13	323	3	172	Ireland, UK
2004	9	211	66	84	Australia, Italy, Japan, Korea, Thailand, Tokyo, UK
2005	9	147	22	64	Croatia, Malaysia, Korea
2006	6	113	46	51	Australia, China, Italy, Malaysia, Norway, South Korea, Taiwan
2007	6	127	81	40	Canada, China, New Zealand, Norway, South Korea, Spain
TOTAL		1196	220	584	

* Programs were offered year round.

Customized Training Programs:

Customized risk analysis training programs were offered in Thailand and Mexico in 2006 and in Nicaragua in 2007, which incorporated three of JIFSAN's Food Safety Risk Analysis courses: Overview, Quantitative Risk Assessment Methods: Model Building, and Quantitative Risk Assessment Methods: Probabilistic Methods. A total of 49 participants attended the training courses including 20 in Thailand, 10 in Mexico and 19 in Nicaragua.

On-line Food Safety Risk Analysis Program:

Four JIFSAN Food Safety Risk Analysis courses are offered in distance learning mode: Overview of Risk Analysis; Food Safety Risk Management; Food Safety Risk Assessment; and Food Safety Risk Communication.

Since a pilot program in 2002, 297 individuals have enrolled in these courses, for a total of 342 class seats (Table 2). Of these 297 individuals, 112 were international participants. Nineteen countries/regions represented included Australia, Canada, Cayman Islands, China, Croatia, Egypt, France, Grand Cayman Islands, Greece, Hong Kong, Italy, Japan, Kenya, Macau, New Zealand, Norway, Panama, South Korea, and UK. In 2006 and 2007, there were 103 class registrations for the online program, of which 69 (67%) were international. A total of 89 individuals from 10 countries participated in the program.

Table 2. Summary of food safety risk analysis online distance learning program (2002-2007)

Dates	No. Classes	No. Class Registrations	No. Intl class seats	No. Participants	Countries
Pilot in 2002-2004	3 (all overview)	80	14	80	Australia, Canada, New Zealand, UK
Sept. 2004-Aug. 2005	4 (2 Overview, Comm., Assessment)	76	19	59	Australia, Canada, China, Grand Cayman Islands, Japan, Macau, Norway
Sept. 2005 - Aug. 2006	4 (Management, Overview, Comm., Assessment)	83	48	69	Australia, Canada, Cayman Islands, China, Croatia, Egypt, France, Japan, Kenya, Norway
Sept. 2006 - Aug. 2007	4 (Overview, Comm., 2 Management)	70	56	60	Croatia (had their own DL Management course) Canada, China, Italy, Korea, New Zealand
Sept. 2007 Dec. 2007	2 (Assessment, QRA)	33	13	29	Canada, Croatia, Greece, Italy, Korea, Macau, Panama
TOTAL		342	150	297	

Outreach

An important part of the JIFSAN's mission is public outreach, with the goal of enhancing the safety of our food supply, and advancing new concepts in public health, applied nutrition, and animal health. To this end JIFSAN works with partner organizations and others on the full range of these issues. Specific outreach efforts include international food safety training programs, a comprehensive online food risk analysis database (FoodRisk.org), and sponsorship of workshops and symposia. These programs have played an important role in introducing effective food safety systems and teaching international audience practices that avoid contamination of food products at the production source as well as implementation of food safety controls within the distribution chain and at the consumer's end.

International Training Programs:

JIFSAN has established an International Training Center providing trainings that involve aspects of food safety, applied nutrition, animal health sciences, and risk analysis, and that have been identified as areas of need within the purview of JIFSAN's responsibilities. Identification of these areas is based on globally recognized food safety concerns and done in collaboration with the JIFSAN Advisory Council, FDA, USDA, USTR and other government agencies.

The first international training program, GAPs, developed by JIFSAN serves as a model for the development and implementation of subsequent programs. The success of these programs has allowed JIFSAN to leverage these resources by developing collaborations with other agencies to identify and fund additional programs and offerings. As awareness for global education and outreach increases JIFSAN continues to build partnerships to address current issues.

Good Agricultural Practices (GAPs) Train-the-Trainer International Training Programs:

GAPs Train-the-Trainer International Training Programs were established to apply GAPs and good manufacturing practices (GMPs) for the production of produce (raw fruits and vegetables) with reduced microbial and chemical loads. Since 2000, the programs have been offered 20 times in 14 countries including Brazil, Chile, China, Dominican Republic, El Salvador, Guatemala, Honduras, Korea, Mexico, Nicaragua, Puerto Rico, Peru, Thailand and Trinidad. A list of GAPs trainings offered by JIFSAN since 2002 appears in Appendix C. In 2007, GAPs trainings were offered in Guatemala, Nicaragua and Peru.

The instructional team for the training programs is composed of faculty/staff from University of Maryland, Clemson University, Mississippi State University, Cornell University, University of California--Davis, JohnsonDiversey and FDA. A core group of instructors are used for each of the training programs that are offered in English or Spanish with text materials in either language. Co-sponsors of the Thailand program translated the course material into Thai. The GAPs team held a two-day retreat in February 2007 to discuss the present status of GAPs and plans for the future.

World Trade Organization Sanitary/Phytosanitary (WTO SPS) Leadership Development Program:

The U.S. has obligations under the World Trade Organization (WTO) food safety agreement that requires it to provide instruction in the use of sound science and risk analysis in rule making and implementation by government and industry to a variety of countries, including China. These principles guide those decisions in the U.S. and we provide China information to adopt comparable approaches and methods.

JIFSAN, in partnership with the U.S. SPS team, Office of the U.S. Trade Representative (USTR), USDA, FDA, U.S. Environmental Protection Agency (EPA), and others, has taken the lead in developing and managing the delivery of this program to Chinese food safety officials. The U.S. SPS team of experts provides technical training in this prototype and the USDA Foreign Agriculture Service leads the interagency coordination and initiation of industry participation.

The program currently provides for a seven week training program, presented in the U.S. to approximately fifteen Chinese food safety officials. Although each offering of the program is unique, they all consist of similar components tailored to the address the needs of the participants. Each program consists of classes on a variety of topics such as American government, agriculture, food regulations and disease, biotechnology, and other SPS issues. Three presentations have been made over the past four years with the last program concluding in July 2007. The program provides for collaboration with a U.S. commodity organization. Funding for the most recent program was provided through the U.S Meat Export Federation and USDA/FAS.

The JohnsonDiversey International Training Initiative:

JIFSAN and JohnsonDiversey Corporation established the JohnsonDiversey International Training Initiative in 2005, which has partially supported the GAPs, GAQPs and WTO-SPS efforts.

The Good Aquacultural Practices (GAQPs) International Training Program:

Worldwide aquaculture has grown by over 10 percent a year over the last 20 years and currently accounts for 52 percent of all fish produced. In the U.S. seafood consumption has risen steadily with domestic suppliers unable to meet demand. Approximately 80% of U.S. seafood is imported from over 50 countries and 40% of that comes from aquaculture operations. It was clear that there was a crucial need for a GAQPs training program. JIFSAN used funds from The JohnsonDiversey International Training Initiative to develop the GAQPs Train-the-Trainer program, modeled after our GAPs program, and designed to address a similar group of participants. A team, with representatives from UM, Virginia Polytechnic Institute, FDA and JohnsonDiversey, developed this program and offered a successful pilot in Vietnam in November 2006. The program has now been revised based on findings from its initial offering and a formal training manual has been developed. It will next be offered in Thailand in May 2008 and again next fall in a location yet to be determined.

The Commercially Sterilized Package Foods (CSPF) International Training Program

Collaborating with FDA and an industry coalition currently consisted of Campbell Soup, General Mills and Kraft Food; JIFSAN is developing a CSPF international training program. The intent of the program is to include all containers (e.g., flexible packages) and not just canned products hence the name change from the program from Low Acid Canned Foods (LACF). More than 40% of LACF/AF consumed in the United States is imported from abroad. At the current time, approximately 6,800 foreign LACF/AF establishments have registered with FDA. While the vast majority of these foreign facilities are unlikely ever to be inspected by FDA, those inspected have disclosed a high rate of non-compliance, resulting in FDA compliance actions (detentions, warning letters).

Our experience in conducting the GAPs and GAQPs training programs has shown that this can be an effective instrument for improving processing of food commodities and propose to use the lessons learned there to initiate the training program. Three meetings were held in 2007. A draft training manual was produced, and a pilot training program is planned for November 2008.

FoodRisk.org On-line Database:

FoodRisk.org (formally the Risk Analysis Clearinghouse) is the only online resource specialized in food safety risk analysis, including risk assessment, risk management, and risk communication. The redesigned JIFSAN FoodRisk.org web site was featured at a display booth that included a live link to the site for real-time searching at the 2006 Society for Risk Analysis (SRA) annual meeting in Baltimore, Maryland. SRA is an interdisciplinary professional society devoted to risk assessment, risk management and risk communication. FoodRisk.org provides exclusive access to a number of unique data sets, tools, and resources, and is used by food safety experts to support risk assessment model building and data analysis. One of the most valuable features of the site is a searchable database of links to food safety and risk assessment information on the web. To ensure the quality and applicability of the data in this database, each entry is fully evaluated and annotated manually.

The JIFSAN FoodRisk.org underwent a major upgrade and prepared for migration to new servers. The upgrade includes a new user interface and a new search engine for the database of food safety links. Searches are faster, the results are presented in an easy to understand format, and users can sort the results in several different ways. The site continues to add unique information and data resources.

Acrylamide Infonet: At the request of the United Nations' World Health Organization and Food and Agricultural Organization, JIFSAN is operating the Acrylamide Infonet (www.acrylamide-food.org), the WHO/FAO Acrylamide in Food Network, through FoodRisk.org. This Network was established as a result of the June 2002 FAO/WHO Consultation on the Health Implications of Acrylamide in Food. The focal point for the network contains a database of researchers/data providers; references for research published elsewhere; studies in development database; listing of acrylamide websites;

acrylamide documentation (general information); events and activities; Infonet updates; and call for data. The site generates over 380,000 hits per year.

Workshops and Symposia:

JIFSAN reaches a broad community by sponsoring/co-sponsoring and participating in workshops, conferences and seminars, promoting debate and dialogue on food safety and applied nutrition issues. JIFSAN has co-sponsored 32 workshops/symposia (see Appendix C), collaborating with different organizations, including University of Florida, Cornell University, Virginia Polytechnic Institute, University of Maryland, Central Science Laboratory of the United Kingdom, U.S. Department of Agriculture, International Life Science Institute, Food Products Association, Inter-American Institute for Cooperation on Agriculture, Society for Risk Analysis, U.S.-Israel Bi-national Agricultural Research and Development Fund, and World Health Organization. They are important to the development of JIFSAN and to the FDA mission both in terms of forming partnerships and in dealing with topics of current interest and importance to public health. In 2007, JIFSAN co-sponsored four workshops/symposia. Through these channels JIFSAN provides access to and stimulates debate on the many dimensions of important public health issues. Highlights of our outreach efforts for the past year include:

- The Tomato Safety Research Needs Workshop, sponsored by JIFSAN and the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS), held February 21-22, 2007, in College Park, Maryland. The workshop brought together academia, industry, and government to discuss approaches and methodologies for comparing and prioritizing research needs for reducing food safety risk caused by pathogens in tomato.
- Tools for Prioritizing Food Safety Risk Workshop, held June 4-6 in Greenbelt, Maryland. The workshop was cosponsored by FPA/GMA Research Foundation, JIFSAN, Interagency Risk Assessment Consortium, ILSI, CFSAN, National Fisheries Institute, and Monsanto, and brought together different organizations who are working on tools for risk screening, ranking and prioritization to discuss approaches and develop recommendations for a process to prioritize risks associated with chemical and microbial contaminants in food.
- The 8th Annual Joint CSL/JIFSAN Symposium - 'Nanotechnology in Foods and Cosmetics,' held June 26-28, 2007, in Greenbelt, Maryland. Speakers from Europe and the US were involved. It addressed the identification of regulatory issues, research approaches, characterization and detection methods, routes of exposure and toxicology, and risk analysis and decision making related to food and cosmetic applications of nanotechnology.
- The Global Chinese Health Food Symposium, July 27-28, 2007, in Chicago, was the first international conference held in the US on Chinese Health Food and its associated concepts and technologies.

- China International Food Safety Conference, September 26-28, in Beijing, China. Dr. Jianghong Meng attended and chaired a session on food safety outreach and training. He also gave a talk introducing JIFSAN's international food safety training programs.

Future Plans (2007-2008)

The third five-year cooperative agreement was awarded to JIFSAN on September 30, 2007 for up to \$2,000,000 per year funding from FDA. The continued financial support will assist JIFSAN to strengthen existing programs and allow expansion of JIFSAN's education, outreach and applied research programs, and external partnerships. Efforts will continue to obtain external funding for program support.

Administrative

- Dr. Jianghong Meng will continue serving as Interim Director of JIFSAN until a search is completed for the Director.
- JIFSAN now reports administratively to the Dean of the College of Agriculture and Natural Resources (AGNR). AGNR has a major initiative in progress, the Center for Food Systems Security and Safety (CFS3). JIFSAN will likely become a key component of this university wide initiative.
- A meeting of the JIFSAN Advisory Committee will be held on May 14-15, 2008. This meeting will concentrate on comprehensive strategic and business planning.

Research Initiatives

- Several research projects have been funded by the renewed Cooperative Agreement in 2007-2008, including:
 - a. Fresh Tomato Safety
 - b. Rapid Detection of *Enterobacter sakazakii*
 - c. Does Emotion Regarding a Food Crisis Predict Consumers' Hesitancy to Eat the Food Once the Crisis is Averted?
 - d. Food Defense Research Initiative: Evaluation of the ALERT (Assure, Look, Employees, Reports, Threat) campaign
- Two additional projects will also be funded in the JIFSAN Competitive Grants program using the carry-over funds in July 2008.
- Funding will continue for postdoctoral research associates in the JIFSAN Postdoctoral Research Associate Program.

Education and Outreach Efforts

- Operation of FoodRisk.org will be further developed under the guidance of the Steering Committee, the new IT Programmer Analyst and Dr. Steven Gendel from the FDA. The FoodRisk.org website and data warehouse have undergone a complete redesign and update. There will also be collaboration with Dr. Maeda, from Japan, on his creation of a Risk Path Finder application. This will bring more content into the FoodRisk Database, and implementation of decision model software.
- Operation of the JIFSAN Internship Program will continue.
- Present plans are to offer GAPs train-the-trainer programs in Chile, Costa Rica and Mexico. Based on feedback from the pilot program, the GAPs manual will be revised.
- JIFSAN will continue the JohnsonDiversey Training Initiative program in seafood aquaculture. A formal manual has been developed, based on results from the pilot program in Viet Nam. The manual is available on the JIFSAN website (http://www.jifsan.umd.edu/gaqps_man.html). A second training program will be offered in Thailand and a third will be considered for the fall.
- JIFSAN will work with the Industry Consortia including Campbell Soup, General Mills and Kraft Food) to develop and offer a pilot program on Commercially Sterile Packaged Foods international training in November 2008.
- The 2007-2008 schedules of courses in the Risk Analysis Professional Development Program are completed and can be accessed at: <http://www.jifsan.umd.edu/pd2006/schedule.cfm>. This will include the Summer Integrated Program and offerings of the courses available in distance learning format.
- JIFSAN was instrumental in offering the World Trade Organization Sanitary/Phytosanitary (WTO SPS) Leadership Development Program for the People's Republic of China since 2005. JIFSAN is currently negotiating for the 2008 program.
- JIFSAN will continue co-sponsorship of symposia, workshops, conferences and other types of meetings. Based on the recommendations from the Organizing Committee for Tools for Prioritizing Food Safety Risk Workshop, a workshop on "Identifying Appropriate Metrics for Public Health Outcomes" was proposed to bring together microbial and chemical risk assessors and focus on the language used by both groups to increase understanding. CSL/JIFSAN Joint Symposium on Developing Responses to Emerging Food Safety Issues will be held in York, UK June 18-20, 2008. JIFSAN plans to co-sponsor a Food Safety Risk Analysis Workshop at Society for Risk Analysis World Congress in Mexico in June 2008.