FOOD IRRADIATION PROCESS CONTROL AND ACCEPTANCE

REGIONAL UNDP PROJECT FOR ASIA AND THE PACIFIC

MISSION UNDERTAKEN IN INDONESIA

FOOD IRRADIATION PROCESS CONTROL, MARKET TESTING AND ECONOMIC FEASIBILITY RPFI-PHASE III

UNITED NATIONS DEVELOPMENT PROGRAMME

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Report prepared for the Governments of Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand and Vietnam

by

the International Atomic Energy Agency
acting as Executing Agency for the United Nations Development Programme

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ABSTRACT

At the request of the Government of Indonesia, the FAO/IAEA expert undertook a one-week mission to Indonesia between 9 and 16 March 1991, to the Center for Application of Isotopes and Radiation (CAIR) of BATAN at Jakarta. This mission included the following:

The expert advised and assisted on matters related to radiation processing and food irradiation relevant to Indonesia and its on-going programmes, including meetings with CAIR Director, Mrs. Nazly Hilmy, and NAEA Deputy Director General, Dr. H. Nazir Abdullah.

Consultations were also held with the various groups within the CAIR regarding their research and development programmes, and in particular the group involved specifically with food irradiation.

In the company of CAIR staffmembers, a meeting was held at the Ministry of Health's Directorate for Food and Drug Control regarding legislative, regulatory and industrial food irradiation actions and activities in other countries, prospects for international trade, and the status of these aspects in Indonesia.

A visit and tour was made at the Jakarta facilities of New York City - New Jersey (USA) - based International Flavours and Fragrances (IFF) which has certain of its raw materials irradiated for hygienic purposes at the (CAIR).

A separate meeting was held at the offices of P.T. Perkasa Ruberindo, whose Sterilindo subsidiary is having an industrial gamma irradiator installed at its rubber products manufacturing site East of Jakarta. The expert provided a seminar on radiation processing in general, followed by a question - and - answer session.

The expert plus CAIR counterparts visited the Jakarta headquarters of the Indonesian Consumer Organization, an International Organization of Consumer Unions affiliate, that has been the most active in the opposition to food irradiation in Indonesia.

Following debriefings the expert moved on to the Vietnam leg of the three nation mission trip.
I. INTRODUCTION

A. Terms of Reference:

1. Consult with National Atomic Energy Agency (NAEA) Centre for Applications of Isotopes and Radiation (CAIR) staff on radiation processing/food irradiation.

2. Meet with Ministry of Health - Food Control Directorate re food irradiation regulations and permission for market-testing of specific irradiated foods.

3. Meet with industrial interests regarding potential commercial irradiation applications.

B. Background Information:

Food irradiation research and development has been underway at the Centre for Applications of Isotopes and Radiation (CAIR), Jakarta, for a number of years. Emphasis has been on spices, particularly pepper, rice, bulbs and tubers, medicinal herbs, and fishery products. Significant non-food irradiation activity, including small-scale medical disposables sterilization services is also on-going. In late-December 1987 the Ministry of Health issued a "Regulation on Irradiated Food" unconditionally approving the irradiation of dried spices to 10 kGy for decontamination; tuber and root crops to 0.15 kGy for sprout inhibition, and, cereals to 1 kGy for disinfestation. The expert undertook an Agency mission to Jakarta as a private consultant in May, 1989 to give lectures on packaging materials irradiation at the Indonesian Packaging Federation/Institute - CAIR - sponsored National Executive Management Seminar on the role of packaging in irradiation technology. While there he visited with CAIR staff and toured the Centre.

II. WORK PROGRAMME

The expert arrived at Jakarta Airport Saturday (9th) evening and was met and accompanied to the hotel by Ms. Rosalina Hariyadi, scientist with the food preservation group. Sunday was an off-day, during which the expert was taken sightseeing and shopping by Ms. Hariyadi and family. Monday (11th) began with a meeting with Ms. Nazly Hilmy, Director of the National Atomic Energy Agency’s Center for Applications of Isotopes and Radiation (CAIR) who brought the expert up-to-date on local radiation processing activities since the expert’s previous visit in May 1989. Of special interest is the fact that some 120 kilo curies of cobalt-60 was to arrive Jakarta by air from Amersham, U.K. for installation into both the 80 kci-rated dry storage irradiator and the larger capacity wet storage irradiator at the CAIR complex. CAIR was to do the installation with
the possible technical assistance of the Bhabha Atomic Research Center (BARC), India, supplier of the smaller irradiator. Also to begin that same month of March with ground-breaking, the latex-rubber surgeons' glove manufacturer, P.T. Perkasa Rubberindo is having a panoramic wet storage industrial cobalt-60 gamma irradiator installed at its manufacturing site 40 km. east of Jakarta. The G.A. Technology (former Gulf Atomic "Triga" research reactor Division) - Radiation Sterilizers, Inc. California joint venture will supply the "hardware" (source rack, conveyer system, etc.) and Nordion International Inc., Canada, will supply the initial 600 kci cobalt-60. The new irradiator subsidiary, P.T. Perkasa Sterilindo will offer irradiation services to others in addition to sterilizing (2.5 kGy minimum dose) P.T. Perkasa products. When this plant is in operation in late 1990 or early 1991, CAIR will transfer its' medical sterilization customers to Sterilindo and concentrate more exclusively on food irradiation R&D.

The remainder of the day plus the following (Tuesday) morning was spent meeting with Director Hilme and NAEA Deputy Director General, Dr. H. Nazir Abdullah, and touring the CAIR complex and discussing R&D activities with the various units including the Radiation Processing Division headed by Dr. Mirzan T. Razzak; the Radiation Biology-Chemistry Division, which includes food irradiation, headed by Ms. Munsiah Maha, and, the irradiator operations group headed by Ms. Rahayu Chosdu. The made-in-Japan low energy electron accelerator used for surface coating-hardening and manufacturing of commercial quantities of acrylamide impregnated wood flooring material was revisited, as were the two research gamma irradiators including the cobalt-60 transfer pool for the dry storage unit, which was being prepared for receipt of the Amersham cobalt the following week. Since late 1990 a Far West Technology Inc. radiochromic film dosimetry system is being phased into the dosimetry activity, including training in its use at the Takasaki Center, Japan. The chemistry laboratory is quite well outfitted with analytical instrumentation including gas-liquid chromatography/mass spectrometry, high performance liquid chromatography (HPLC), UV-VIS spectro-photometry, differential thermal analysis (DTA), etc. A JOEL scanning electron microscope was there, and an electron paramagnetic resonance (EPR) spectrometer is to be added this year. The polymer lab. was outfitted with two Instron physical property measuring units, plus other up-to-date equipment. All-in-all, an impressive array of instrumentation, and professional staff is at hand. During the tours the expert met with and briefed Dr. Alumanda de la Rosa of the Philippine Nuclear Research Institute regarding the previous weeks mission there. Dr. de la Rosa, a biochemist, was on a two-week scientific exchange visit at CAIR to transfer the "Ames" mutagenicity testing technique to counterparts there. The afternoon was devoted to a seminar by the expert plus follow-up discussions, especially with invited attendees from outside CAIR with an interest in radiation processing.

The following (Wednesday) morning Ms. Maha and Ms. Hariyada accompanied the expert to a meeting at the Ministry of Health's Directorate for Food and Drug Control. Dr. Ading Suryana, Director of Food Control presided, and Dr. Rahardjo, pharmacist, and
Ms. Sjamsimar Sitaba, Head of food legislation also participated. The expert provided a briefing on legislative, regulatory and industrial food irradiation activities in other countries, and prospects for international trade in irradiated foods and ingredients. The Food Control people seemed to share a positive attitude regarding food irradiation, but expressed acute awareness of the Indonesian Consumer Organization's active, negative position against it, strongly influenced by its' Penang, Malaysia IOCU parent. Exchanges between CAIR and the Consumer Union have been published in Jakarta newspapers and, as elsewhere, the controversy appears to have had a dampening effect on positive legislative/regulatory action. It was, however, agreed to accomodate Ms. Maha's request for formal approval to permit test marketing of such products as irradiated dried fish which have not yet been generally cleared for distribution and sale. Only a few unconditional approvals (spice decontamination; tuber/root crop sprout inhibition; cereals disinfestation) have been finalized thus far, all in December 1987.

After lunch we visited the Jakarta plant of the New York City - New Jersey (USA)-based firm, International Flavors and Fragrances (IFF), an irradiation services customer of CAIR. IFF manufactures flavoring materials including spice blends, and fragrances for such products as soaps and detergents for sale to industrial customers in the food and non-food industries. When certain IFF materials have microbial levels above their own and/or customer specifications they have them irradiated at CAIR to bring the levels within specifications. At the time of the mission IFF was having imported onion powder plus paprika irradiated at CAIR, which was also irradiating talcum powder, peat soil for soybean inoculation, and a variety of medical disposables-and-related for others. We were given a tour of the IFF manufacturing plant and laboratories by Wim Eggenkamp, Technical Director-Flavors, originally from Holland, and A.T. Guananto, Quality Assurance Manager, who were in turn briefed on world-wide food irradiation developments. IFF has operations on every continent, in a number of countries, and could become an important factor in international trade in irradiated food ingredients.

The next (Thursday 8th) morning Ms. Maha and Ms. Hariyadi accompanied the expert to the downtown Jakarta offices of P.T. Perkasa Rubberindo in the new Landmark Office Building to meet with staff of the Sterilindo subsidiary, including Director Aan Selamet and President-Director Awan Ahimsa. The four-hour visit, which extended through an on-site lunch provided by Sterilindo began with a slide seminar by the expert on irradiation technology and its applications. There were many questions whereas those in attendance would soon be operating an industrial multipurpose cobalt-60 service gamma irradiator for the very first time. The discussion, and questions from the ten-or-more Sterilindo staff in attendance at any one time continued on into the early afternoon until it had to be terminated so as to make our afternoon appointment.
From there we visited the Indonesian Consumer Organization, principal food irradiation antagonist group in the country, at their converted two-story house in a residential neighborhood of Jakarta. In May 1989 the expert had met with Executive Secretary Zaim Saidi for about an hour at a National Executive Management Seminar on "Radiation Technology in Packaging". The Agency had sponsored the expert’s participation as a lecturer, and Saidi attended since the subject involved irradiation which he was actively opposing as a food process-treatment. As mentioned above, the Indonesian Consumer Organization is closely allied to, and heavily influenced by the International Organization of Consumer Unions (IOCU) Regional Centre at Penang, Malaysia. Saidi holds a BSc in food technology from Bogor University Agricultural Institute in West Java; so in May 1989 the expert, also a food technologist, endeavored to clear up his negative confusion regarding food irradiation through the lengthy discussion, plus follow-up mailed literature. Judging from subsequent actions against food irradiation by him and his Organization, this effort was evidently over-shadowed by conflicting IOCU, Penang efforts.

On this occasion we met with Vice Director Agus Pambagio, a B.Sc. in Chemical Engineering from Bandung Technical Institute, in West Java, from which Ms. Hilmy, Ms. Maha, Ms. Hariyadi and others at CAIR also graduated. Mr. Pambagio completed a masters degree in engineering management in the U.S. He is the designated consumer representative to attend the Agency-sponsored information workshop in late-May at Bangkok, and he impressed us as being mature, reasonable and relatively open-minded regarding food irradiation, especially whereas the subject is apparently quite unfamiliar to him. A member of the Jakarta press corps is also nominated to attend the Bangkok workshop. This visit was more of the nature of a get-acquainted meeting as Mr. Pambagio did not wish to get into the pros-and-cons of food irradiation until the Bangkok Workshop, by which time he would be able to better familiarize himself with the subject.

Friday morning was spent in debriefings with the various CAIR groups, and finally with Director Hilme, followed by departure for the airport and the flight to Bangkok via Singapore. The expert spent the night in Bangkok before proceeding on to Hanoi on Saturday, the 16th, to begin the Vietnam leg of the three nation mission.

III. CONCLUSIONS AND RECOMMENDATIONS

Whereas programs, etc., were concluded to be in good order with no apparent out-standing issues or problems, the expert has no specific recommendations; only the general one for all parties concerned in Indonesia, and the FAO/IAEA to continue on with current activities and support, leading towards industrial food and ingredient irradiation as appropriate.
IV. PERSONS CONTACTED

Ms. Nazly Hilmy Director, CAIR
Dr. H. Nazir Abdullah Deputy Director General, NAEA
Ms. Munsiah Maha Head of Chemistry
Ms. Rahayu Chosdu Head of Irradiator Operations
Ms. Rosalinda Hariyadi Senior Scientist
(Other CAIR staff scientists/technologists)

Dr. Ading Suryana Director of Food Control, Ministry of Health
Ms. Sjamsimar Sitaba Head of Food Legislation, Ministry of Health
Dr. J. Rahardjo Pharmacist, Ministry of Health
Mr. Wimm Eggenkamp Technical Director, IFF Indonesia
Mr. A. T. Guantano Quality Assurance Mgr., IFF Indonesia
Mr. Arwan Selamet President-Director, P.T. Perkasa Sterilindo
Mr. Aan Selamet Director, P.T. Perkasa Sterilindo, and staff
Ms. Agus Pambagio Vice-Director, Indonesian Consumer Organization