# ACTIONS

# Joint Project with the International Atomic Energy Agency (IAEA)

• The food irradiation project for immunocompromised persons began in 2010 and is part of a coordinated research program with funding from the International Atomic Energy Agency (IAEA) and involving 18 other countries, including the United States, Canada, Hungary, Ireland, Bulgaria, Brazil, Argentina,Tunisia, Portugal,Thailand, China, Malaysia, Pakistan, India, Korea, Indonesia, Bangladesh, Philippines.



Examples of the IAEA's work to support humanitarian goals include assisting Nepal in its recovery from an earthquake in April. "The agency has been helping authorities to test the safety of critical buildings like hospitals and schools," Yukiya Amano told delegates, "using non-destructive testing methods like radiography." Nepal was also helped by shipments of long-lasting irradiated food supplies from Indonesia, which were irradiated to extend their shelf life by the National Nuclear Energy Agency of Indonesia, BATAN, which developed this capability with the help of a joint project by the IAEA and the UN Food and Agriculture Organization. [Source: http://www.world-nuclear-news.org/NP-Amano-focuses-IAEA-ondevelopment-1409151.html]

#### Consultation and Seminars with Stakeholders

- Consultation with government and private hospitals around the country began in December 2013 and was completed by the first half of 2014.
- Seminars on irradiated food for immunocompromised persons were conducted for nutritionists and dieticians last 2013.

#### Irradiated food for Calamity Victims

- Plans are also being drawn to develop irradiated food for victims of calamities such as typhoons and earthquakes.
- The experimental meal may also be developed to serve as military and relief rations.





Zenaida M. de Guzman Head, Biomedical Research Section

For more information,

please contact:

> Atomic Research Division Telephone Nos. (632) 925-9211 (632) 929-6010 to 19 local 273 and 238 Email: zmdeguzman@pnri.dost.gov.ph



#### Department of Science and Technology PHILIPPINE NUCLEAR RESEARCH INSTITUTE

Commonwealth Avenue, Diliman, Quezon City PNRI Trunkline: (632) 929.6010 to 19 Website: www.pnri.dost.gov.ph Ready-to-Eat Meals for Immunocompromised Persons

## PROBLEM

Immunocompromised persons are those whose natural defenses against diseases are very low. Among these are cancer patients undergoing chemotherapy or radiation therapy, organ transplant patients and HIV or AIDS patients, who are very vulnerable to pathogens such as salmonella and E. coli.

Thus, preparing the daily diet for these types of patients requires special consideration. Immunocompromised patients require a clean and sterile diet, where the microbes are significantly reduced and/or totally eliminated. However, conventional procedures for sterilizing food such as heat treatment or autoclaving tend to risk compromising the taste and nutrients of the meal and takes more electricity to use.



## OUTCOME

#### Irradiated Food for Immunocompromised Persons

- The PNRI Biomedical Research Section has developed a more effective alternative to the conventional food sterilization treatment through gamma irradiation.
- Irradiated pork and chicken adobo, brown rice, and fresh fruits and vegetables will compose the complete ready-to-eat clean and sterile diet.
- Food irradiation is already well-recognized globally, and even Southeast Asian country like Indonesia is already using irradiated food for feed HIV patients and children suffering from malnutrition

## **STRATEGIES**

### Food Irradiation for Clean and Sterile Diets

- PNRI research and development studies show that it requires 1 to 3 kGy for pre-cut fresh vegetables and fruits and brown rice for clean diets and around 10 to 25 kilogray (kGy) of radiation dose for total elimination of microbes resulting to a sterile diet (meat and poultry) meant for immunocompromised patients.
- Food irradiation does not make the food radioactive. The procedure is approved by the Food and Drug Administration and complies with the CODEX Alimentarius, the international standard for food and consumer health.

## Sterilization Without Nutrient Loss

- Unlike in autoclaving, food irradiation retains the sensory qualities (taste, color, and flavor) of the food and its nutrients.
- As tested in the irradiated adobo, the food retained its protein and Vitamin B content.



### Healthy, Nutritious and Long-lasting Food

- PNRI chose the local adobo for its popularity. More importantly, the Filipino viand has a naturally longer shelf-life than most other meals and may also be cooked with low salt content, making it well-tailored for the patient's delicate diet.
- Brown rice is preferred by both hospitals and patients for its high nutritive value.
- Irradiation of pre-cut fresh papayas,mangoes, melons, cucumber, lettuces, carrots and other salads which complete the balanced meal is already well-tested, and will make the meal complete and balanced.

# Irradiation and Food Packaging for Longer Shelf-life

- Food irradiation also combats spoilage by keeping the food safe from insects and bacteria, allowing consumers to store food longer than usual.
- PNRI also experimented on irradiating different types of food packaging and storage means such as plastic, aluminum foil and starch-based biodegradable materials to determine the suitable packaging material for the said food.