

Adoption of Irradiation Technologies in Kenya: Benefits, Applications and Opportunities

Key messages

- Irradiation is a proven technology that is used in over 50 countries for various applications such as sterilization procedures, food processing and medical treatment
- Irradiation treatments or technologies make use of gamma rays, x-rays or electron beams that do not make the product radioactive and unsafe for human use
- Irradiation does not affect/change chemical or the nutritional value of the food products being processed, preserved or consumed
- Irradiation technologies present golden opportunities that are scientifically safe and clean methods of disinfecting products, minimize food wastage and losses prevalent among Kenyan mango fruit growers with no harmful by-products
- Countries such as the USA, New Zealand and Australia have embraced specified irradiation technologies as a mandatory treatment prior to import of certain food products as a food safety and control requirements

Context

Irradiation is the process of exposing various products to ionizing gamma rays, X-rays or electron beam in a highly controlled manner to eliminate virus, bacteria, pathogens, insects and other undesirable organisms (Prakash, 2020). This technology has been well established in the world, with more than 300 such facilities currently in different countries. In India, currently there are around 25 such facilities for various applications. In South Africa, there are currently three facilities that irradiate food as well as commodities such as medical devices. These are located in Cape Town, Durban and Kempton Park. Tanzania has adopted use of irradiation technologies in evaluating radioactivity and other components in foods as well as environmental substances. Many other countries in Africa such as Morocco and Egypt are at an advanced stage of adoption of irradiation technologies, and have commercial applications of these technologies.



Fig 1: Irradiation facility (Photo: L. Potterton/IAEA)

What are the Key Benefits of Irradiation?

Irradiation has the following benefits:

1. A wide range of products can be treated in a single irradiation facility/ plant
2. High throughput of products up to 16MT/ hour
3. It is a cold and clean process - no temperature rise or residue
4. The product can be treated in the final packaging - no need for repackaging

Applications of Irradiation

Irradiation finds applications in many areas such as:

1. Sprout Inhibition in potatoes, onions, garlic



2. Sterilization - Medical disposables



3. Insect Disinfestation
Cereals, Pulses & Dry Fruits



4. Shelf Life Extension and
decontamination - Meat,
Poultry and RTE products



5. Hygienization -
Spices, herbal products
and nutraceuticals



6. Quarantine - Cut
flowers & Fresh Fruits
for Export



7. Disease prevention -
Honey & Beekeeping
Equipment



8. Hygienization
- Pet food



Opportunities/ Potential Benefits to Kenya

As a country, we stand to reap tremendous benefits with adoption of irradiation technologies in key sectors

Manufacturing Boost

- Similar to what has been experienced by other countries e.g. India, the availability of irradiation facilities will spur development of industries such as medical devices and disposables, an food processing.

Market Access Enabler

- Several key export markets like the USA, Australia, New Zealand, Malaysia and certain EU Countries require irradiation treatment of several products prior to export.

Food Safety and Security

- By eliminating harmful pathogens like salmonella, listeria, fungal spores and also harmful insects that cause spoilage, irradiation can enable longer term safe storage of key foods such as food grains, meat and seafood.

Conclusion and Way Forward

Adoption of irradiation technology in Kenya will bring forth many benefits, namely:

1. **Enhanced Food Safety:** By Implementing irradiation as an effective method to eliminate or reduce pathogens, pests, and spoilage organisms in food products, ensuring a safe and hygienic food supply chain.
2. **Improved Agricultural Productivity:** By Utilizing irradiation technology to control agricultural pests, increase crop yield, and reduce post-harvest losses, thereby promoting sustainable agriculture and food security.
3. **Ensure Product Safety:** Adopting irradiation as a reliable method for sterilizing and decontaminating medical devices, pharmaceuticals, cosmetics, and other products to prevent infections and improve overall product safety.
4. **Facilitate Trade:** By Aligning with international standards and regulations regarding irradiated products to facilitate the export and import of goods, ensuring fair trade practices while maintaining the safety and quality of products.
5. **Research and Development:** By encouraging research and development in the field of irradiation technology to explore its potential applications, improve effectiveness, and enhance public understanding of the technology.

Hence, we recommend that the National government as well County governments consider setting up irradiation facilities in order to enjoy these benefits.

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