

AUSTRALIAN NUCLEAR FORUM

Gamma Irradiation of Food in Australia

Policy

Gamma irradiation of food should be permitted in Australia under the recommendations and restrictions specified by the UN Codex Alimentarius Commission General Standard for Irradiated Foods and in accord with advice from the Joint Expert Committee on Food Irradiation. (Adopted 27/8/03)

Summary and Conclusions

Research overseas and in Australia has shown that the shelf life of some foods can be significantly extended and microbial contamination and insect infestation reduced to safe levels by treatment with gamma radiation without detriment to public health. Irradiation is an alternative to the use of chemicals which often leave harmful residues in the food. Currently about 40 countries have introduced legislation allowing the irradiation of specific foods. No standards have yet been promulgated for Australia, although some irradiation of foods has been done. In the interests of facilitating export and import trade, it would be prudent for this country to adopt the international standard and allow the process to compete commercially.

Considerations

1. Historical Development

The need to preserve food for troops in World War 2 stimulated interest in treatment using gamma radiation. Further research was subsequently coordinated by the IAEA, FAO and WHO of the UN and continues to the present.

2. Effects of Gamma Radiation on Food

Treatment by gamma irradiation does not cause food to become radioactive. The radiation dose used depends upon the purpose of the treatment, not on the type of food. In practical terms, applications are limited by undesirable changes in taste, texture, colour and odour of specific foods at the doses required for treatment. Relatively low doses in the range of 0.1-10 kiloGray (kGy) are used. These compare to doses of 10-25kGy used for the sterilisation of medical and other items. Irradiation produces free radicals but these disappear long before the food is likely to be consumed. It causes some nutritional losses to an extent which is no greater (sometimes much less) than alternative treatments such as freezing, dehydration, curing, fumigation and cooking.

3. The Codex Alimentarius Standard

Following advice from the Joint Expert Committee on Food Irradiation (JECFI) in 1980, the Codex Alimentarius Commission of the UN issued in 1984 a Code of Practice which limited the radiation dose to an average of 10kGy and stated that irradiation of all foods to doses of up to 10kGy is safe. Since that time, about 40 countries, including most of Australia's trading partners, have adopted the Codex standard and permit the irradiation of food. Notable exceptions are Australia and New Zealand.

In 1999, a joint FAO/IAEA/WHO Study Group recommended that the 10 kGy limit be removed to allow foods to be irradiated to any dose appropriate to achieve the technological objective. This recommendation was based in part on evidence accumulated since 1980 on the regular use of higher doses for the sterilisation of hospital diets for immuno-suppressed patients and on the possible need for higher doses to adequately suppress pathogens such as Salmonella in meat and poultry.

4. Current Status Overseas

Approximately 250 irradiation facilities are in operation around the world. About 60% of throughput involves the sterilisation of medical devices. Nevertheless, there has been an increasing application for foods, particularly in the US, Europe and South Africa.

5. Current Status in Australia

In 1986 the NH&MRC adopted its model food standards regulation which was to become the basis for legislation by the individual states, but by this time the anti-food-irradiation forces had become organised and raised vocal opposition. Following two House of Representatives Committee enquiries, the Keating Government in November 1989 imposed a 3-year moratorium during which several unresolved issues were to be investigated. The moratorium was extended indefinitely in 1992 but is now considered to have expired. Despite several events which stimulated some interest in the process, and periodic attention by the Australian and New Zealand Food Authority (ANZFA), no final decision regarding regulation has been made. In the interim, Steritech has been given approval to irradiate herbs and spices to a dose of 30kGy. The council of State and Territory health ministers has rejected a recommendation from ANZFA to irradiate nuts. ANZFA is currently examining an application to irradiate tropical fruits, probably mangoes, for insect control.

6. Commercial incentives

Historically, Australia has been reluctant to allow anything that might endanger the marketability and image of its agricultural produce and this has been used as a reason to reject food irradiation. Further, Australia does not have the severe problems of spoilage during storage and transport, food-borne diseases and large seasonal fluctuations in price and availability faced by some other countries and there is little demand from consumers for improvements in aspects that might be addressed by irradiation. On the other hand, problems associated with the use of chemicals such as nitrite or ethylene oxide and the shortcomings of other forms of treatment such as heat and water dips make irradiation an attractive alternative. The most likely applications for irradiation in Australia are treatments such as the reduction of microbial contamination of herbs and spices, the reduction of *Salmonella* in poultry and the disinfestation of fruit for export.

Australia has been slow to develop legislation for the control of irradiated foods. This is unwise because irradiated food can enter the country and some form of regulation needs to be in place to detect and control it. If, as seems likely, the irradiation of a limited range of foods or food ingredients is allowed, the regulations should be consistent with internationally recommended general practice using a radiation dose appropriate to achieve the desired technological result and having regard for aspects such as wholesomeness, palatability, shelf-life and consumer safety. The banning of irradiated foods against international advice and practice is undesirable and will be construed by other countries as an artificial barrier to trade. When introduced, the process should be presented to the Australian public by a respected authority in a positive way to help counter groundless fears in the public mind and the hostility and opposition of anti-nuclear groups.

7. References

1. "Food Irradiation in Australia", P Moore, ANF Discussion Paper no.8, 1/10/02.
2. "Code of Practice for the Operation of Radiation Facilities Used for the Treatment of Foods", Codex Alimentarius Commission, FAO/WHO, Rome, 1984.
3. "High-Dose Irradiation: Wholesomeness of Food Irradiated With Doses Above 10kGy", Report of a Joint FAO/IAEA/WHO Study Group, WHO Tech. Report Ser. 890, Geneva, 1999.