

**SUBMISSION  
FROM THE SUSTAINABLE AGRICULTURE & COMMUNITIES ALLIANCE  
(SACA)**

**RE APPLICATION FROM THE QUEENSLAND DEPARTMENT OF  
AGRICULTURE AND FISHERIES (QLD DAF) FOR THE IRRADIATION OF ALL  
FRESH FRUITS AND VEGETABLES**

*For the following reasons, the members of the Sustainable Agriculture and Communities Alliance (SACA) are opposed to the irradiation of fresh fruit, vegetables or grains.*

**Rights of Consumers to Healthy Food:**

The health of people seems to have been given less consideration than that of pet cats: The irradiation of cat food is now banned in Australia because between 2008 and 2009, approximately 90 Australian cats died or were paralysed because they had eaten irradiated food. These cases are clear evidence that irradiation can have harmful, and possibly not yet understood, impacts on the quality of food and on consumer's health.

The Queensland Government is now considering the irradiation of food for human consumption, and we believe that what affects the health of other living beings is highly likely to affect people.

The scientific community uses animals for testing purposes, to judge whether substances and toxins would be likely to harm people. In the case of the death of the cats that ate irradiated food and the subsequent ban on this food for felines, we believe this could be an indication of harm to other animals including people. In fact a well-known study involving a small number of children has revealed the development of serious health problems from the time that the malnourished children commenced consumption of irradiated food. These problems resolved on discontinuation of the experiment.

**Toxins in Irradiated Foods:**

Studies on food irradiation have shown that a chemical generated by irradiation 2-dodecylcyclobutanone (2DCB) causes the formation of free radicals and significant DNA damage. 2-DCB is a unique irradiated product of palmitic acid, an acid that is found in large quantities in most fruits and vegetables. Studies have found 2-DCB in irradiated mangoes and papayas, as well as in meat.

An Osaka Institute of Public Health study found that 2-Alkylcyclobutanones, such as 2-dodecylcyclobutanone and 2-tetradecylcyclobutanone, could be detected in irradiated meats or fish and cooked foods with irradiated ingredients such as eggs or chicken which had been stored frozen for up to one year. (1)

The Report of the Japanese study included the statement: *"Among the known markers of food irradiation, 2- alkylcyclobutanones are uniquely found only in irradiated samples. The radicals induced by irradiation generate various radiolytic compounds, including 2- alkylcyclobutanones, from fatty acids and their esters in fatty foods. 2-Dodecylcyclobutanone (2-DCB), formed from palmitic acid, and 2-tetradecylcyclobutanone (2-TCB), formed from stearic acid, are recommended as markers for irradiation in the European official method EN1785"*

In a Hearing before the *US Senate Sub-Committee on Health and the Environment*, and also in a letter published in *Nutrition Reviews*, Volume 50, Issue 10, October 1992, page 311, George L. Tritsch Ph.D, from the Roswell Park Cancer Institute, Buffalo, New York has publicly stated: *"I am opposed to food irradiation because it is clear that this process increases the levels of mutagens and carcinogens in the food. The inevitable consequence of this is that in two to five decades in the future, the incidence of cancer will increase from what we see now, in direct proportions to the amounts of irradiated food consumed..."*

Like George L. Tritsch, Ph.D., cancer expert, the Food Commission of the United Kingdom expressed concerns about the radiolytic by-products that are often formed in irradiated food. These include benzene, formaldehyde and cyclobutanones.

SACA members have not been able to find any evidence that there have been adequate studies of the range of toxins that are produced by food irradiation and their effects on human and animal health.

As the UK Food Commission stated, *"Extension of the EU list of foods permitted for irradiation could mean that in future a significant part of the diet of consumers will consist of irradiated foods. The long-term impacts of this to health remain unknown. Far more research is required prior to exposing populations to such a diet."* In fact what research has been done up to the present time by independent scientists has shown some evidence of harm to human beings who consumed irradiated food.

According to the USA group, Cancer Prevention Coalition, "the overdue need for such studies" (on the health effects of irradiated foods) "is further emphasized by numerous reports of chronic toxic effects in insensitive studies on test animal fed unextracted whole irradiated food. These include reproductive damage in rodents and chromosomal damage in rodents, monkeys and children." (2)

#### Loss of Nutrients in Irradiated Foods:

Scientific studies have shown that irradiation destroys up to 96% of vitamins A, B, C, E and K along with other essential nutrients: The Food Commission, Britain's leading, independent watchdog on food safety, stated in July 2002, that food irradiation can result in loss of nutrients. For example, vitamin E levels can be reduced by 25% after ionising radiation, and vitamin C by 5-10%. (3)

According to the Center for Food Safety in the United States, irradiated foods can lose from two to 95% of their vitamin content. Irradiation can destroy up to 80% of the vitamin A in eggs, up to 95% of the vitamin A and lutein in green beans, up to 50% of the vitamin A and lutein in broccoli and 40% of the beta-carotene in orange juice. Irradiation also doubles the amount of trans fats in beef. (4)

"A US Department of Agriculture study showed that not only did irradiated pork lose some thiamin content, but when the pork was cooked, there was greater additional thiamine loss than occurred in cooked pork that had never been irradiated. ... Proponents of irradiation also argue that if a food does not show significant nutrient loss after undergoing irradiation with 500,000 rad, then irradiation with 5 million rad should be acceptable without further nutrition testing. That is

erroneous; nutrition loss after irradiation is dose dependent. There is increasing evidence that nutritional deficits increase susceptibility to or progression of some infections and can damage the immune system. Could irradiating foods actually promote certain infections? ...

Irradiated foods might be useful for severely immunocompromised people, particularly those with major deficits in delayed-type immunity or acute neutropenia. However, if this is undertaken, there should be meticulous efficacy assessment. Only after determination of microbe-specific effectiveness should expansion to whole subpopulations with potential immunosuppression (e.g., older people) be considered." (5)

As there are vitamin losses in irradiated food, it is important to note that in one experiment it is recorded that vitamins were given at the same time as giving irradiated foods. This would have counteracted any evidence of health effects from lower vitamin intake and biased the interpretation of the experiment.

#### Another Question From Our Members:

As x-rays can cause mutations, and as one of the reasons for irradiating food is to kill microbes, and as some microbes are resistant to this treatment, it is reasonable to suppose that if food is subjected to irradiation, some of the microbes may mutate into harmful species. Any bacterial species that go through the human or animal gut have the propensity to exchange DNA with microbes living in that gut, with possible development of health problems. We have not discovered any evidence for rigorous research on this question, and therefore the precautionary principle should apply: i.e., radiation is not safe until proven safe with ironclad research. As with genetic research, the discoveries are ongoing, and often unexpected results come from the use of new technologies, as has happened with antibiotic resistance and herbicide resistance.

#### Alternative Treatments:

Other treatments are effective, cheaper and safer: For quarantine purposes, there are several alternatives to irradiation that are safer, cheaper and without noticeable changes to the fruit or vegetables. Cold treatment for example is just one of these alternatives, and it meets quarantine requirements of other countries such as New Zealand. Other treatments include: cold storage, controlled atmosphere, washing, brushing, waxing, and dipping.

#### Government Responsibility To Protect The Health Of Consumers:

At a time when there is so much emphasis on eating healthy food, and when health authorities state that people on low incomes find it difficult to afford enough fresh fruit and vegetables, it should be a responsibility of both State and Federal governments to ensure that the fresh produce that people buy is as rich in vitamins as possible. The elimination of processes such as irradiation that can cause toxicity is also a government responsibility.

#### Ineffectiveness Of Irradiation In Killing Insects:

Scientific tests have shown irradiation is ineffective in killing insects and extending the shelf life of fruit. The dosages of ionising radiation needed to kill insects such as fruit fly are too high for most fruits to tolerate. With low dosages, insects are still alive after irradiation. Irradiated fruits are damaged from water loss and softened tissues, and are more sensitive to refrigeration and bruising in transport.

Due to enzyme damage from irradiation, some fruits do not continue to ripen, with consequent loss of taste appeal and digestibility. This is an important factor in sales and marketing, and in promoting a diet rich in fresh produce.

**Summary:**

- SACA members are opposed to food irradiation in general because:
- Irradiation is a dangerous technology looking for a use.
- There are healthier technologies to eliminate insects and pathogens from foods and food products.
- Numerous scientific studies have exposed the potential harmful effects of food irradiation.
- Years of scientific research have shown that “radiolytic products” - chemicals created when food is exposed to radiation – can be harmful to our health.
- Food Standards Australia New Zealand has acknowledged that irradiation depletes the nutritional value of food.
- SACA members are greatly concerned about the cumulative effect of eating an irradiated diet.
- As there are numerous options and practices already in place for pest control, and no requirement from our trading partners to use irradiation, there is no justification to use irradiation for quarantine controls.
- SACA members are also extremely concerned that both the current and proposed labelling regulations deny people the right to choose whether or not to consume irradiated food.
- There must be a legislated requirement for individual labelling/stickering of any foods such as herbs, herbal teas, etc., that have so far been approved for irradiation.
- As warnings about food irradiation have been ignored in the past, and approvals have ensued, it is imperative that all foods that have been approved so far for irradiation are labelled as such. Labelling must include the words “irradiated” or “treated with radiation.”
- Fresh fruit and vegetables should remain fresh and not irradiated. This is a health issue.
- Consumers must have the right to choose unadulterated foods in pursuing a healthy diet .
- Consumers must also be protected from eating foods that they are unaware may cause harm when consumed over the long term. This is the responsibility of government and of organisations such as FSANZ.

- There is no research to prove that subjection to x-rays will not result in unexpected or harmful mutation of bacteria that may affect the human gut and human and animal health.
- It is outrageous that the nutrition of foods may be allowed to be destroyed and that foods that people eat in the belief that they are eating something healthy could actually do them harm in the long term.
- The only beneficiaries of food irradiation would be the large multinational corporations, and the losers would be the consumers whose diet would be adversely affected, and also the very food producers who are lobbied by irradiation proponents.
- **Threat To Food Security:** Approval of irradiation in Australia will allow cheap and possibly over-sprayed and sub-standard irradiated food from overseas countries to undermine Australian food production. Australian farmers are struggling against already low supermarket prices. This is compounded by the need to produce food at a time of climate change, droughts, lower water availability, and loss of working holidaymakers from overseas.
- For the above reasons, State and Federal Government have a responsibility to protect food producers, as Australia is in danger of losing food security. We cannot rely on imports, or even export markets. Arrangements with overseas countries can disappear overnight, as the Coalition government now realises from its debacle with China.

SACA members contend that the physical effects of radiation on foods have not changed, despite the propaganda from irradiation proponents .

If rigorous scientific study by scientists *without* links to the food industry had been a sustained government policy over the years, it would have been found that food irradiation in Australia is too dangerous to implement. As stated by the scientists who wrote a report examining both sides of the irradiation debate: current evidence does not exist to substantiate the support or unconditional endorsement of irradiation of food for consumption. ( 6)

We strongly believe that on the weight of evidence against the safety of food irradiation, no fruit, vegetables or other foods should be irradiated.

As there are safer options to treat fruit and foods for any bacterial or insect infestation, SACA members call on you to decline approval for the irradiation of fresh fruit and vegetables, to refuse any further irradiation approvals, and cancel all previous irradiation approvals.

Yours truly,



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