

FSANZ
Food Standards Australia New Zealand

Re: Submission A1193 on 'Irradiation of all fresh fruit and vegetables'

Please find enclosed my submission in regards to the proposal to irradiate select fruit and vegetables grown in Queensland.

Deadline for submissions is now December 11th r

Commercial application:

The commercial approach is that the irradiation of foods could extend the shelf life and eliminate microorganisms and insects by using a irradiation method. Any substance used on a food that kills insects can affect human health to a lesser degree, but killing microorganisms doesn't kill toxins, only bacteria and moulds

Food irradiation is being promoted as a simple process that can be used to effectively and significantly reduce food-borne illnesses around the world. However, a thorough review shows there is considerable debate on the issue of health concerns from irradiated food among international agencies and between different countries

Tolerance Levels

The tolerance of fruits to irradiation varies between species and varieties and is influenced by ripeness at the time of treatment (Oufedjikh et al., 2000; Kader, 1986). Several investigations have demonstrated low-dose irradiation for extending the shelf life of certain fresh fruits without affecting their quality. However, the time sequence of the application of combined treatments may also play an important role (Farkas, 1990). In the case of fungi, heat treatment preceding irradiation usually provides a greater antimicrobial effect Padwal-Desai et al. (1973). The heat treatment may increase [phytoalexins](#) and similar compounds that increase fruit resistance. [Umbelliferone](#) and scopoletin have been found to inhibit the phenylalanine ammonia-lyase activity – amino-acid essential to protein utilization.

Research Brief

According to Kim and Thayer (1996), irradiation causes DNA damage, whereas heat causes membrane destabilization. With bacterial spores, the effect of heating followed by irradiation seemed to be additive or slightly greater than additive, while the reverse order of treatment (i.e., irradiation followed by heating) was found to be more synergistic (Farkas and Roberts, 1976). Mild heat treatment and the addition of natural antimicrobial compounds before irradiation treatment has the potential to increase *B. cereus* radiosensitization by more than 1.56 times (Lacroix et al., 2013).

Given that irradiation is known to affect several chemical changes and enzyme activity along with DNA, the process of implementing irradiation treatment, just to extend shelf life appears to be very dramatic, especially when the destruction of enzyme activity affects human metabolism. Let alone the failure of the seeds to

germinate as a result of irradiation treatment. Irradiation doses and storage duration also affects [pectinesterase](#) enzyme (PE) activity especially in citrus. As the doses increased, the fruit exhibited higher activity (Dennison et al., 1967). The onflow effect of eating phenylalanine inhibited fruits and vegetables, alters the normal protein food metabolisms in human, not ideal for growing children.

Conclusion

As a result one can only conclude that current evidence does not exist to substantiate the support or unconditional endorsement of irradiation of food for consumption.

In addition, consumers are entitled to their right of choice in the consumption of irradiated versus un-irradiated food. Different countries are evaluating their local and global risks and benefits prior to developing and recommending national and international food irradiation policies.

While internationally, very few countries apply this form of food treatment, other than China and Russia, although the proposal is being discussed internationally, but until more evidence appears in human studies, this form of use on food is experimental. We would like to avoid past issues like DDT that was considered safe, until found guilty of affecting human health.

Yours sincerely

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