

Irradiated food and internal bleeding

Illusion

When it was still early days in the food irradiation debate (the 1950s), there was this optimistic idea that you could sterilise food with very heavy irradiation doses and have the food still fresh, wholesome and nutritious. This turned out to be an illusion.

The harsh realities were brought home in a rather dramatic way. In short-term feeding studies no deleterious effects had been found in experimental animals from irradiated food. So, a longevity and reproduction study was set up to appraise the wholesomeness of irradiated beef stored for 6 months at 76°F (25°C).

As rats were used in this trial the diet contained all the vitamins and minerals required in rat diets. One batch of beef had been irradiated with 27.9 kGy and another one with 55.8 kGy. These different batches were used in the diet for different groups of rats to find out whether a double irradiation dose would give a different outcome. All irradiated beef was incorporated into the diets on a 35% dry weight basis.

Dead rats

Despite the fact that this was a longevity study, intended to run for many months, the first rat died on 11th day. Autopsy showed that this rat had died from internal bleeding.

Reference

Metta, V.C. et al. 1959. Vitamin K deficiency in rats induced by the feeding of irradiated beef. J. Nutrition 69: 18-22

Within 46 days a total of 15 rats had died: 14 male rats and one female. In all cases the cause was internal bleeding.

On the other hand there were no dead rats in the control group of 20 male and 20 female rats. They had received an identical diet with this difference that the beef component had not been irradiated. So, the conclusion was that the bleeding was caused by changes in the beef induced by irradiation.

Vitamin K

As vitamin K plays an important role in blood clotting and bleeding was the problem, the investigation went into the direction of vitamin K.

It had been found that experimental diets for rats do not require vitamin K. This vitamin is normally supplied through bacteria in the gut. So, would supplementation with vitamin K stop the internal bleeding? Another experiment confirmed that this was indeed the case.

From then on all feeding experiments with rats fed irradiated diets have included a vitamin K supplement. And the pretense has been that everything is fine. However, this extra supplementation is a tacit admittance that irradiated food can cause severe vitamin K deficiency.



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