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Irradiation destruction of vitamin C

A scientific fact

Vitamin C, also called ascorbic acid, is rapidly destroyed by gamma radiation in dilute solutions (1). This is confirmed by a table from a review report which shows that ascorbic acid is very sensitive to ionising radiation (2). So, there is no controversy on this point.

However, this destruction is called irrelevant by the proponents of food irradiation. According to them the breakdown product dehydroascorbic acid has practically the same vitamin C activity as ascorbic acid (3). This idea turns out to be old fashioned and wrong.



The reality

According to an authority on vitamin C, both ascorbic and dehydroascorbic acid have biological activity. But these biological activities differ (4). Only ascorbic acid has the typical vitamin C working. The breakdown product dehydroascorbic acid is highly unstable (5) and has no vitamin C working. If through circumstances high levels of dehydroascorbic acid are formed, then it can even damage a number of biological processes and affect health adversely (6).

Confirmation

Ascorbic acid and sodium ascorbate have a detoxifying effect on the liver. This was researched in the 1970s and one research report is here of special interest.

This research concerned the protective effect of ascorbic acid and sodium ascorbate on acute liver toxicity. This toxicity was brought about through the administration by mouth of sodium nitrite plus aminopyrine to rats. Also dehydroascorbic acid was tested, but this did not give any protection (7). So, this research report confirms what is stated in the monography on vitamin C (4).

Vitamin C deficiency

A particular aspect of vitamin C activity was illustrated in a trial with monkeys fed irradiated peaches. Like humans, monkeys do not produce their own vitamin C as most other animals do. They must get their vitamin C from food.

In this feeding trial one batch of peaches was irradiated with a dose of 27.9 kGy and another batch with 55.8 kGy. The differently irradiated peaches were of course for different groups of monkeys. The peaches were canned and stored for 3 months to one year. Then they were included in the diet for the trial monkeys on a basis of 35% of dietary solids. The other 65% was ground Purina Monkey Chow. It is important to realise that this commercial monkey chow contains ample vitamin C.

After about 15 months in the trial monkeys on a diet with irradiated peaches showed symptoms of vitamin C deficiency. After additional supplementation with vitamin C these symptoms disappeared. Control monkeys with non-irradiated peaches in their diet did not show any Vitamin C deficiency symptoms (8).

What does this show? That there was an extraordinary demand for vitamin C inside the monkeys to counter toxicity from irradiated peaches.

Well worth remembering that around 1970 two lengthy review articles on the toxicity of irradiated foods were published including carbohydrates (9, 10).

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