

About Radioactive Bananas

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Nuclear proponents often make the silly-sounding claim that a person gets a greater annual dose of radiation from eating a banana than by standing beside a nuclear power plant.

The claim is false. People who say such things are abusing science for their own purposes. While it is true that bananas are naturally radioactive, eating a banana does not increase a person's annual radiation exposure.

Why are bananas radioactive?

Bananas are rich in potassium (chemical symbol K), and a very small fraction of that naturally-occurring potassium is in fact radioactive – about one-hundredth of one percent (actually 120 parts per million).

The radioactive variety of potassium is potassium-40 (K-40, 0.012% of total potassium). The much more abundant non-radioactive varieties of potassium found in the body are potassium-39 (K-39, 93% of total K) and potassium-41 (K-41, 7% of total K).

These percentages are the same the whole world over, they never change. Every tiny bit of naturally occurring potassium has the same three varieties in the same exact percentages.

Since the bodies of all animals including humans require potassium to function properly, all animals, including humans, are slightly radioactive. It is a fact of life.

Bananas and other foods rich in potassium are also radioactive for the same reason.

Does eating a banana increase your radiation exposure?

The average banana contains about half a gram of potassium. The K-40 in such a banana will hold about 15 becquerels of radioactivity. Nevertheless, eating that banana does not add to the annual radiation dose of the human being who eats it.

That's because the body already has a lot of "natural" potassium including K-40 [which is unavoidable], and any new "natural" potassium ingested is balanced by eliminating a comparable amount of "natural" potassium to maintain the "homeostasis" of the body.

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In other words the body's own mechanisms will not allow for a net increase in potassium levels – and therefore will not allow for an increase in K-40 content in the body.

*Here's what the Oak Ridge Associated Universities has to say;
(ORAU was founded in 1946 as the Oak Ridge Institute of Nuclear Studies.)*

"The human body maintains relatively tight homeostatic control over potassium levels. This means that the consumption of foods containing large amounts of potassium will not increase the body's potassium content. As such, eating foods like bananas does not increase your annual radiation dose. If someone ingested potassium that had been enriched in K-40, that would be another story."

<http://tinyurl.com/yrfu4s>

The same argument does not work for radioactive caesium, or for any of the radioactive pollutants given off by a nuclear power plant, because most of these materials do not exist in nature at all – and those that do exist in nature are not subject to the same homeostatic mechanism that the body uses to control potassium levels.

Consequently any foodstuffs or beverages containing radioactive caesium or other man-made radioactive pollutants will cause an additional annual dose of ionizing radiation to the person so exposed.

But that is not the case with bananas, or with other foods rich in potassium. Here is a partial list of such foods:

Food	Serving Size	Potassium (mg)
Tomato paste	60 mL (¼ cup)	658
Potato, baked	1 (12cm x 6cm)	610
Pinto or kidney beans	175 mL (¾ cup)	566 to 591
Lentils	175 mL (¾ cup)	579
Avocado	½ whole	487
Squash, baked	125 mL (½ cup)	473
Banana	1 medium	422
Papaya	½ medium	392
Milk, 2%	250 mL (1 cup)	387
Chickpeas	175 mL (¾ cup)	378
Yogurt	175 g (¾ cup)	362
Fish	75 g (2 ½ oz)	313

Source: Eat Right Ontario, <http://tinyurl.com/kgcm3yw>