

Uranium, No More Secrets

It's a pretty safe bet that just about every child over the age of ten in America knows what uranium is, but how many of us actually know anything about this element other than that it's "nuclear"?

Uranium is actually a very abundant element. It is found in trace amounts in nearly every piece of soil on Earth. It is also found in similar quantities in seawater. We often think of uranium as a very rare and preciously guarded material that is shrouded in mystery behind government classified documents and deep underground bases.

It comes as no surprise to anyone that the two largest uses for uranium are the manufacture of military weapons and as the energy source in nuclear power plants. While this may seem straightforward and limited, the subcategories and subsequently derived technologies are numerous. Particularly with depleted uranium (DU), which is uranium that is no longer capable of sustaining a nuclear reaction; it is used as a radiation barrier, armor, explosive projectile, and often it is recycled and re-enriched in order to be able to once again produce a sustained nuclear reaction. The most obvious use of course, is in bomb manufacturing, but not necessarily nuclear weapons. Even un-enriched uranium in sufficient quantities is explosive.

A growing concern is that people who live in areas where non-nuclear uranium-based weapons have been used will be exposed to toxic levels

of uranium. The symptoms and health effects of ingested uranium are actually more severe than just radiation exposure. Uranium is actually a very weak emitter of radiation and the majority of that radiation doesn't even penetrate the skin. As such, a large number of studies have been conducted on both humans and animals in order to determine the exact levels of uranium that create adverse health effects and what those effects are.

One might be inclined to assume that since we live in relatively safe country of the United States, that uranium toxicity from a former battlefield is something that, God willing, we will never have to be concerned with. Toxicity from a battlefield, unless you were/are a deployed military personnel, is highly unlikely. There are, however, significant sources of uranium exposure inside the United States that are of concern to everyone and it is those that we need to address.

Different regions of the United States have different concentrations of uranium in the soil that can enter the ground water supply, or produce increased levels of background ionizing radiation, which has been conclusively proven to increase the risk of cancer development. This particular natural source, though, is easily remedied by adequate filtration.

The source of greater concern is the contamination of our food supply. That was not a mis-statement. The majority of farmers in the agricultural industry rely upon enormous quantities of fertilizer to restore

nutrients to the soil to ensure crops grow. Two types of fertilizer contain significant quantities of uranium as an unintentional, and considered by some to be an unavoidable, byproduct.

How can uranium be in fertilizer?
Two ways: phosphate fertilizers are made from phosphate ores, which typically contain greater concentrations of uranium than most soil. While for sometime a side business existed for extracting uranium from phosphate, many of these plants have had to close down because the most effective chemical catalyst for this process increased in price enormously over the past ten years and it is too costly to process phosphate with this technology. Now uranium is left in the phosphate and enters farmland soil.

The other way uranium enters fertilizer is, ironically, from nuclear power plants. Power plants produce a number of wastes, and one of those wastes is ammonium nitrate solution, which can be used in fertilizer. These solutions contain traces of uranium, which remain intact through the fertilizer production process.

Individuals who work in fertilizer manufacturing plants are at an extremely high risk of poisoning from uranium, as well as from a number of other powerful toxins in fertilizer that we won't get into. But even the average person is now at risk of uranium exposure, either from farmland waste water runoff entering the community water supply, or from uranium being absorbed by the crops and entering the food supply.

It sounds like the plot of a cheap sci-fi novel, but truth can truly be stranger than fiction.

There are a number of researchers that dismiss the severity of uranium toxicity, citing that ingested uranium is barely absorbed, only 0.5-1% of it is absorbed into the body and a significant portion of that is easily excreted by healthy individuals.

This argument is misleading because, while it may be true that the quantities of uranium absorbed from a single exposure may be too insignificant to create an acute reaction, the effects of repeated exposure of low doses can bioaccumulate in various regions of the body and over time create health problems.

In 1999, the Agency for Toxic Substances and Disease Registry in Atlanta, GA published a report about uranium toxicity from various sources. They concluded that uranium had a significant toxic profile and had a tendency to accumulate in the tissues of the liver, kidneys, bone, and even the brain. They also noted that uranium was also a reproductive toxin that not only impacted the fertility of males, but also increased the risk of abnormal fetal development in pregnancy.

While some of the information was limited because of the lack of real long-term human exposure analysis, the evidence that did exist was enough to be able to conclude that uranium toxicity is a serious health risk.

Respiratory inhalation of uranium particles in individuals who worked in the mining sector, fertilizer manufacturing, coal plants, and other high exposure occupations had significant amounts of uranium deposited in their lungs and in the pulmonary lymph nodes indicating the increased risk of lung diseases.

The risk of impaired kidney function and renal damage from continuous exposure is also greatly increased because of the affinity that uranium has with kidney tissues and the limited effectiveness of the kidneys to excrete uranium.

The agency in Atlanta also noted that uranium is absorbed by crops in varying efficiencies, with the most absorption occurring in potatoes. They advised against the consumption of unwashed potatoes because of their high uranium concentration. Other root plants and vegetables also contain high concentrations of uranium.

The methods for cleansing the body of uranium have not been well established and so far there have been no studies that prove that there is a safe and effective method. While there are programs that exist for chelating various types of heavy metals from the body, uranium, has never been conclusively tested.

The only real advise is to prevent uranium exposure to the best of one's abilities. This means drinking quality bottled water, and filtering water that comes into the home. It also means consuming organic vegetables that have not been grown on soils that use either phosphate or

ammonium nitrate fertilizers. Stay away from suspicious potatoes and other root vegetables and their derivatives, i.e. French fries, hash browns, etc.

While the research is limited, chlorella and cilantro may afford some protection against the absorption of uranium into the body through the digestive tract and may be able to bind with uranium to some degree in the blood stream and prevent it from being deposited in tissue, but this has not been fully researched and is only a possibility.

While it is unfortunate that there has not been more research conducted on the long-term effects of uranium exposure on the human body, it is even more disappointing that a known toxin has been allowed into our food. Hopefully this article will help spread the word and encourage those with the means to help enact change, as well as provide more options to cleanse people who have been exposed.



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