University of Kentucky
College of Public Health
Epidemiology and Environmental Health

November 6, 2023

Pete Participant
123 No Street
East Palestine, Ohio 44413

RE: Serum Dioxin Test Results

Dear Mr. Participant,

Thank you for your participation in the University of Kentucky East Palestine Health Tracking Study and the Biological Pilot Study. You participated in the Biological Pilot Study at the First United Presbyterian Church on 7/17/2023.

I am writing to share with you the results of your serum dioxin levels and how your level compares with average levels found in the US for your sex and age group. The concentration of all dioxins measured in serum is commonly given as a Toxic Equivalent (TEQ) value. TEQ is measured as picograms per gram of serum lipid or pg/g lipid which is *one-trillionth* of a gram.

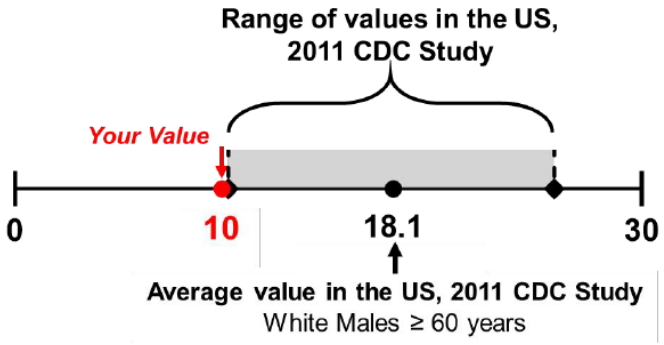
What was your dioxin level?

Your serum dioxin TEQ value: 10.0 pg/g lipid

How does your level compare to the average values in the US?

Your serum dioxin TEQ value **is below** the levels found in white males in your age group in the US.

The US comparison is from a 2011 study by the Centers for Disease Control and Prevention (CDC). In the 2011 CDC study, white males 60 years and older in the US had an average serum dioxin TEQ of 18.1 pg/g lipid and ranged from 10.2 to 25.8 pg/g lipid.



The 2011 CDC study used serum from multiple individuals across the US to create 'pooled' samples. The same laboratory was used to measure your serum dioxin levels. If each person's serum in the CDC study had been analyzed for dioxins individually rather than pooled, the range would have been much wider.

Thus, although dioxins may have formed during the burning of chemicals in the railcars, the level of dioxin that you may have experienced was not high enough to increase your serum dioxin level beyond what is typically found in the US. If any new information becomes available about dioxin comparison values, we will let you know.

How do other participants in the East Palestine pilot study compare to average values in the US?

Serum dioxin levels were measured in a total of 18 East Palestine pilot study participants. Each participant's value was **below or within the range** of levels found in the 2011 CDC study for their specific age range, race, ethnicity, and sex.

What are dioxins?

Dioxins are a group of chemicals including polychlorinated dibenzo-p-dioxins and furans (PCDD/F) and coplanar polychlorinated biphenyls (cPCBs). Dioxins and furans were chemicals of concern following the train derailment and subsequent rail car burn. They form when burning occurs (forest fires or household trash) or during chemical reactions. PCBs are man-made products which were banned in 1979 and are not thought to be associated with the derailment, but because these PCBs are similar to dioxins and furans, the blood test also includes them. All of these chemicals can enter the food chain and accumulate in the human body. People can be exposed to dioxins by eating high-fat foods such as milk products, eggs, meat, and some fish. Thus, older adults typically have higher levels in their bodies than younger adults and children. All Americans have some dioxin in their body from these sources.

How was the TEQ calculated?

The TEQ is measured by picograms per gram of serum lipid (pg/g lipid). A picogram is one-trillionth of a gram which is very, very, very small. This amount can be compared to one teaspoon of a chemical in the combined water of 1,000 Olympic sized swimming pools.

The TEQ represents the biological activity of the dioxins. Twenty (20) individual dioxins were measured in your sample. The TEQs are calculated by multiplying the value of each chemical measured in your serum by a factor related to how toxic that chemical is and then summing the resulting value for each chemical.

Where do I find more information about dioxins?

More information about dioxins can be found from the CDC. A fact sheet is attached for convenience.

What if I have more questions?

If you have any questions or would like the values for each chemical measured in your serum that make up your TEQ, please contact me directly by phone at 859-562-2119 or email: Erin.Haynes@uky.edu.

We will share your urine test results with you as soon as it is available.

We are grateful for your participation in this study as together we continue to evaluate the exposures and health impacts of the East Palestine train derailment.

Sincerely,

Erin N. Haynes, DrPH, MS
Kurt W. Deuschle Professor of Preventive Medicine and Environmental Health
Chair, Department of Epidemiology
University of Kentucky