

# Why Does National Security Depend on Forever Chemicals?

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## STORY AT-A-GLANCE

- › One month after a federal study found a direct association between serum levels of PFAS and testicular cancer in military personnel, the military released a report to Congress claiming the chemicals are "quite stable," and "critically important" to military readiness
- › David Andrews, senior scientist at EWG, said the report fell short in effort and scope. Government regulations are not proposing a ban on PFAS as alluded to in the report, and the statements were "completely unsubstantiated, and it's almost a fear-mongering statement"
- › PFAS-laced firefighting foam increases the risk to firefighters. One retired Air Force firefighter told KFF Health News that the Air Force told personnel it was "just soap and water, completely harmless"
- › PFAS is associated with multiple health effects, including cancer, thyroid disease, ulcerative colitis, liver and kidney damage, reproductive damage, birth defects, and low birth weight babies
- › The U.S. military does not recognize dangers from PFAS, does not recommend serum levels in veterans, and is intent on creating food from plastic to feed military men and women who have dedicated their lives to defending this country. Thank you so much for your service. Here's a big bowl of plastic-derived food

In August 2023, the Office of the Assistant Secretary of Defense for Energy, Installations, and Environment and the Office of the Assistant Secretary of Defense for Industrial Base Policy released a report in which they claimed:<sup>1</sup>

*“PFAS are chemically quite stable, and many are water and oil repellent, heat resistant, and/or stain resistant ... DoD is reliant on the critically important chemical and physical properties of PFAS to provide required performance for the technologies and consumable items and articles which enable military readiness and sustainment.*

*Losing access to PFAS due to overly broad regulations or severe market contractions would greatly impact national security and DoD's ability to fulfill its mission ...”*

PFAS are fluorinated chemicals that are known to be endocrine disruptors and are known to accelerate metabolic changes in the body. Since the 1999-2000 survey, the National Health and Nutrition Examination Survey (NHANES) has measured blood serum PFAS in adults and children and released the data every two years.<sup>2</sup>

Biomonitoring studies have also measured levels from occupational exposure, communities that have contaminated drinking water, and throughout the general population.

The Agency for Toxic Substances and Disease Registry (ATSDR) notes that while blood levels for PFOS and PFOA have declined as use has declined, exposure to other PFAS chemicals may rise. Data show that the highest exposure is occupational and in communities that have been exposed, most in their water supply.<sup>3</sup>

## **Department of Defense Report ‘Fell Short in Effort and Scope’**

As ATSDR has noted, the NHANES has recognized that rising serum values of PFAS may have indicated a significant health risk since 1999. As KFF Health News reports,<sup>4</sup> a DoD study in 1974 demonstrated the chemical was fatal to fish and in 1983 a report showed it was deadly to mice.

Despite this knowledge, it is apparent from the subsequent actions of the military that they were not protecting service men and women. As demonstrated by a photo release from the Defense Visual Information Distribution Service<sup>5</sup> in 2013, personnel working

without protective gear on Travis Air Force Base, California, were surrounded by mounds of PFAS-laced firefighting foam.

James M. Inhofe National Defense Authorization Act for Fiscal Year 2023<sup>6</sup> authorizes appropriations for military activities of the Department of Defense and requires the assessment of PFAS chemicals in military products and equipment. This prompted the August 2023 DoD report to Congress in which the DoD claimed PFAS chemicals were critical and eliminating them could undermine military readiness.<sup>7</sup>

According to the report,<sup>8</sup> most of the weapon platforms incorporate these chemicals, including microelectronic chips and lithium ion batteries. The chemicals are also used in a variety of uniform clothing, footwear, tents and duffel bags.

For more than 50 years, the DoD has used PFAS-laced firefighting foam and contaminated at least 359 military sites or nearby communities, with over 200 others under investigation. Yet, the report did not address health concerns. The Environmental Working Group (EWG) told KFF Health News that the “report lacked acknowledgment of the health risks or concerns posed by PFAS and ignored the availability of PFAS-free replacements for material, tents and duffel bags.”<sup>9</sup>

According to David Andrews, senior scientist at EWG, the report fell short. “It’s kind of like that report you turn in at school, when you get a comment back that you did the minimum amount possible,” Andrews said. In addition to this, Andrews notes that the government has not proposed banning PFAS chemicals as was alluded to in the report.

“The statements are completely unsubstantiated, and it’s almost a fear-mongering statement,” Andrews said. “I think the statement is really going beyond anything that’s even being considered in the regulatory space.”

Kevin Fay, executive director of the Sustainable PFAS Action Network, a coalition of organizations and researchers who support PFAS compound use, told KFF Health News<sup>10</sup> that using a one-size-fits-all approach “will gravely harm national security and economic competitiveness.”

# Study Shows Direct Association Between One PFAS Chemical and Cancer

The Congressional report was published one month after a 2023 research study<sup>11</sup> confirmed what multiple other studies have shown in the past – firefighters have a higher rate of testicular cancer than people in other occupations, which points to the presence of PFAS in firefighting foam.

The difference was this federal study demonstrated for the first time a direct association between serum levels of PFOS, a chemical in the PFAS family, and testicular cancer. The researchers tested blood serum drawn from Air Force servicemen and banked at the Department of Defense Serum Repository.

They gathered data from 530 Air Force servicemen with a diagnosis of testicular germ cell tumors and 530 controls that were matched for several factors including ethnicity, race, birth date, the year they entered the service and the year the sample was collected. The researchers found elevated concentrations of some PFAS chemicals in the blood supply of those employed in firefighting in the military and at bases where there was a high PFAS concentration in the drinking water.

Elevated levels of PFOS were associated with testicular germ cell tumors. “To my knowledge, this is the first study to measure PFAS levels in the U.S. military population and to investigate associations with a cancer endpoint in this population, so that brings new evidence to the table,” Mark Purdue, senior investigator at NCI and co-author of the study, told KFF Health News.<sup>12</sup>

Testicular cancer has a high rate of diagnosis in active military personnel aged 18 to 40 years who are in peak physical condition. It was the age distribution and exposure to PFAS contamination that prompted the researchers to look for a possible connection.<sup>13</sup>

Kevin Ferrara, a retired Air Force firefighter, told KFF Health News that the Air Force barely warned of any dangers. “We were told that it was just soap and water, completely harmless,” Ferrara said. “We were completely slathered in the foam – hands, mouth, eyes. It looked just like if you were going to fill up your sink with dish soap.”<sup>14</sup>

Ferrara does not have cancer but has other health concerns he attributes to his exposure to PFAS. While the Department of Veterans Affairs does not currently recommend blood testing,<sup>15</sup> KFF Health News reports that the Congressional PFAS task force introduced an act that would require the VA to treat conditions that are linked to PFAS exposure as well as provide disability benefits.<sup>16</sup>

## **More Health Risks Associated With PFAS Chemical Family**

KFF Health News describes the case of Gary Flook, who served in the Air Force for 37 years as a firefighter. Flook did not speak to KFF Health News as he is part of a 3M class action lawsuit filed in August 2022.<sup>17</sup> June 22, 2023,<sup>18</sup> 3M agreed to pay \$10.3 billion to roughly 300 communities in a multidistrict litigation to help clean up PFAS chemicals in the water supply.

There are an additional 3,000 claims that are still unsettled. Michael London of the New York law firm Douglas & London is representing plaintiffs in the city of Stuart, Florida. He told Time, "There are also 5,000, perhaps 6,000 individuals who have brought personal injury cases [nationwide]."<sup>19</sup>

One 2023 study<sup>20</sup> published in a Lancet publication, eBioMedicine, found an association between exposure to PFAS and an increased rate of thyroid cancer. The researchers noted that this is a worldwide concern, given the ubiquitous nature of PFAS exposure.

One research team explained that an accumulation of epigenetic events induced by PFAS exposure can "synergistically amplify tumorigenicity and cancer progression," adding that immune system suppression and chronic inflammation also likely play a role. Endocrine-disrupting chemicals that accumulate in body tissue can also lead to fatty liver disease.

"This bioaccumulation," researchers wrote in Environmental Health Perspectives, "coupled with the long half-lives of many PFAS, leads to concern about the potential for PFAS to disrupt liver homeostasis should they continue to accumulate in human tissue even if industrial use is abated."<sup>21</sup>

The researcher’s systematic review and meta-analysis compared exposure to liver injury. The data showed higher levels of serum alanine aminotransferase (ALT) indicating liver damage with exposure to several PFAS chemicals. Exposure to PFOA was also linked to higher aspartate aminotransferase and gamma-glutamyl transferase levels – two widely used markers of liver disease – in humans.

Another 2022 study<sup>22</sup> published in the American Heart Association journal Hypertension showed women with the highest concentration of PFAS chemicals in their bloodstream also had a 71% increased risk of high blood pressure. According to the Endocrine Society, PFAS exposure may contribute to:<sup>23</sup>

Thyroid disease	Ulcerative colitis
Testicular cancer	Kidney cancer
Pregnancy-induced high blood pressure	Altered cholesterol levels
Liver and kidney damage	Altered immune response
Reproductive damage	Birth defects
Low birth weights	Tumors and cancer

## **U.S. Military Wants to Feed Plastic to Service Men and Women**

Apparently, American servicemen and women are not exposed to enough plastic pollution on military bases and in the food and water supply. In 2020 Iowa State University announced that the Defense Advanced Research Projects Agency (DARPA) awarded the University and partners a \$2.7 million grant to create a process that would make food from plastic and paper waste.<sup>24</sup>

The military hopes to use this to feed the men and women who have dedicated their lives to defending this country. They believe the ability to turn paper and plastic waste products into a consumable could help with short-term “nourishment” and improve

military logistics for extended missions. They estimate the total award could reach \$7.8 million before the project ends.<sup>25</sup>

The proposed system hopes to convert plastic waste into fatty alcohols and fatty acids and paper into sugar that would then be bioprocessed by single-cell organisms into an edible mass rich in protein and vitamins. In other words, the hope is that microorganisms in the lab can do what those in the environment and ocean cannot — convert endocrine-disrupting chemicals found in plastic into vitamins and proteins.

DARPA also awarded Michigan Tech<sup>26</sup> and collaborating researchers \$7.2 million to turn plastic waste into protein powder and lubricants. In 2022, Stephen Techtmann's lab announced they had indeed converted plastic into something that smells like yeast extract. "But he [Techtmann] hasn't tasted it. First, he wants to know it's safe, free from anything that might be toxic. It is, after all, made from plastic."<sup>27</sup>

In an era where fake meat is valued over regeneratively and biodynamically grown real meat,<sup>28</sup> it doesn't take much to imagine that the next step could be plastic food for all. DARPA is starting with military men and women who put their lives on the line to protect our country. Thank you so much for your service. Here's a big bowl of plastic.

## Sources and References

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- <sup>4, 12, 13, 14, 16</sup> [KFF Health News, August 9, 2023](#)
- <sup>5</sup> [Defense Visual Information Distribution Service, Flurry of Foam Released at Travis](#)
- <sup>6</sup> [Public Law 117-263](#)
- <sup>7, 9, 10</sup> [KFF Health News, November 20, 2023](#)
- <sup>11</sup> [Environmental Health Perspectives, 2023;131\(7\)](#)
- <sup>15</sup> [US Department of Veterans Affairs, PFAS](#)
- <sup>17</sup> [Justia, August 4, 2022](#)
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