

LINSEE MULLENEX, Student of Forensic Science, Fairmont State University, Fairmont, WV, 26554, and KRISTY HENSON, Assistant Professor of Forensic Science, Fairmont State University, Fairmont, WV, 26554. An Examination of Gunshot Residue and Lead Exposure.

This study examines the longevity of gunshot residue (GSR) for lead-based and lead-free ammunition and verifies that lead-free ammunition is truly lead-free. While a GSR presumptive test is not a definitive answer to whether GSR is explicitly present, it gives law enforcement an idea of whether to consider if more expensive testing is needed. This research will also highlight whether different means of examination for GSR in a forensic setting are necessary due to the evolving variety of lead-free ammunition entering the market.

Switching to lead-free ammunition will significantly reduce lead exposure. Lead shows high toxicity for many organisms but continues to be dumped into the environment in large quantities. Lead poisoning can cause side effects such as anemia, infertility, and vitamin D deficiency.

Ward's Gunshot Residue Presumptive Kit and Sherlock Instant Lead Test Kit were used in this research to indicate the presence of lead, barium, and antimony with color change using a specific sequence of chemicals. Ward's Gunshot Residue Presumptive test was tested during three scenarios in which a firearm was discharged. The Sherlock Instant Lead Test Kit was used to swab all ammunition advertised as lead-free such as the primer, gunshot residue, casing, and bullet.

In conclusion, Ward's Gunshot Residue Presumptive Kit was not sensitive enough to use in real-life scenarios and yielded no results. The Sherlock Instant Lead Test Kit confirmed that lead-free ammunition is truly lead-free, reducing lead exposure when firing a gun and potentially creating issues when examining GSR (lead specifically) in forensics settings.