

Freezing Biological Evidence: Key Considerations

The Handbook on Biological Evidence Preservation: Best Practices for Evidence Handlers

Overview of Considerations in Freezing of Biological Evidence

The *Handbook on Biological Evidence Preservation* primarily provides guidance to property and evidence custodians who bear the responsibility for the storage, tracking, and final disposition all evidence types, in addition to all other handlers of biological evidence. During its deliberation process, the *Technical Working Group on Biological Evidence Preservation* conducted a review of relevant scientific literature and examined current practices related to the preservation and storage of biological evidence. The recommendations offered by the Working Group aim to balance the interests of justice with the real-world constraints in funding, personnel, and equipment resources that exist within criminal justice organizations. One of the foremost issues discussed during the Working Group's tenure was the freezing of biological evidence. The Working Group recommends that the following evidence types be stored at a temperature at or below -10°C (14°F):

Short Term Storage

- Urine
- Wet bloody items (if cannot be dried)
- Feces

Long Term Storage

- Urine
- Feces
- Liquid DNA Extracts

The Working Group made a deliberate choice not to recommend that *all* biological evidence be frozen for the following reasons:

- ***The Working Group's findings are based in scientific research and current trends in DNA analysis.*** Studies have demonstrated the highly stable nature of DNA. Further, DNA technology has become more sensitive, enabling analyses of smaller amounts of DNA. While in some cases, biological material from dried stains benefitted from being stored in a refrigerator or in a freezer, there are many studies that point to DNA being fully recoverable from dried stains after many years even in extreme temperatures. Scientific evidence supports that properly packaged biological material stored in an environment at a temperature is maintained thermostatically between 15.5 °C and 24 °C (60 °F to 75 °F) will yield highly reliable results for decades. Therefore, we do not recommend agencies freeze all biological evidence types.¹

¹ See the *The Handbook of Biological Evidence Preservation's* "[Storage Matrices](#)" and "[Works Cited](#)" for relevant references.

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- ***Evidence is often held in multiple locations throughout its lifecycle.*** This fact makes it extremely difficult to maintain the evidence in a constant frozen state. Scientific evidence shows that thawing and re-freezing biological evidence degrades the DNA and hinders analysis. Practical realities make this requirement difficult thus, we limited the evidence types in which we placed that stringent requirement.
- ***Lengthy retention times required by legislation make freezing all biological evidence types extremely costly.*** Given the marginal benefits and potentially destructive nature of freezing and thawing cycles, the cost of freezing for indefinite periods of time may be an unnecessary expense for resource strapped jurisdictions.

As mentioned above, the primary goal of the *Handbook on Biological Evidence Preservation* was to provide guidance for property and evidence custodians who are responsible for storing, organizing, tracking, and final disposition of all evidence types. Currently, property and evidence personnel have very limited guidance on the proper storage of evidence and are a forgotten piece of the puzzle. This handbook does not preclude crime laboratories from going above and beyond in ensuring every piece of evidence yields the most DNA possible and therefore freezing all biological evidence. However, we strongly urge crime lab managers and other stakeholders to consider the entire lifecycle of the biological evidence, as well as the costs and benefits before making such an investment.