Nucleosomes consist of DNA wrapped around histone proteins. Together the DNA, histones, and other associated proteins are called chromatin. Nucleosome positioning along the DNA affects the ability of transcriptional proteins to access the DNA and therefore affects DNA expression. This is called chromatin accessibility (nucleosome-rich areas are said to be inaccessible and nucleosome-poor areas are accessible). We have developed a first-in-class nanodroplet-mediated formaldehyde-assisted isolation of regulatory elements (FAIRE) assay to extract DNA and associated proteins from formalin-fixed paraffin-embedded (FFPE) tissues so it can be used in future chromatin accessibility assays. Because FFPE tissue processing is not standardized, this study works to understand the effect of storage condition time at 4° Celsius (for 0 hours, 4 hours, and 24 hours) before fixation on extracted chromatin quality from male C56BL6J mouse liver and kidney organs using previously developed FAIRE Evaluation Metrics (FEM). As storage time increases, we expected a decrease in chromatin quality. We found that as storage condition time increased, there was an increase in percent soluble chromatin, a lack of detectable DNA fragments, and a decreasing signal over background in enrichment for accessible chromatin via qPCR. As Biobanks increase FFPE tissue storage, there is a need for technologies to extract high-quality chromatin from preserved samples.