W4   The Impact of the 2018 Farm Bill on the Forensic Analysis of Cannabis

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Learning Overview: After attending this presentation, attendees will understand the legal and forensic landscape of marihuana/hemp analysis and also understand a validated analytical approach that meets these new requirements.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing a framework for meeting the forensic requirements of the 2018 Farm Bill.

In December 2018, the President of the United States signed into law the Agriculture Improvement Act of 2018 (Farm Bill). This law introduced two significant changes to our drug laws. First, the term "hemp" was defined as, "the plant *Cannabis sativa* L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta-9 Tetrahydrocannabinol (THC) concentration of not more than 0.3 percent on a dry weight basis." Second, the law excluded the term hemp from the definition of marihuana in the Controlled Substances Act. In response to the changes at the federal level, states have enacted their own varied legislation to allow for hemp cultivation and processing and the sale of hemp products. This also led to additional analytical challenges for the states.

This workshop will provide an overview of changes in the law, describe an analytical approach to providing reliable results that conform to the new legal requirements, and provide an overview of the work conducted to validate the methods incorporated into the analytical approach. State laboratory managers will describe their varying approaches to meeting these new challenges from a state that had legalized marijuana prior to changes in federal law and a state that had not.

Analytical testing requirements of suspected cannabis submissions to seized-drug laboratories have changed. Formerly used testing protocols—analytical schemes—included tests such as macro/microscopical analysis, the Duquenois-Levine color test, and separation analyses like thin-layer- Gas Chromatography/Flame Ionization Detector (GC/FID) and Gas Chromatography/Mass Spectrometry (GC/MS). These testing procedures allowed for the identification of cannabis, but they are no longer sufficient to distinguish between marihuana and hemp because of the new requirement to quantitatively analyze the sample and assess the THC content (the quantitative property that separates hemp from marijuana).

To address the new legal requirements, Drug Enforcement Administration (DEA) scientists developed a new testing protocol. The new analytical scheme includes macro/microscopical analysis (to identify cannabis plant material), a cannabis typification color test (to assess the ratio of THC to Cannabidiol (CBD)), and GC/MS (to identify THC and assess THC concentration at the 1% level). This workshop will guide attendees through the background and design of this new testing protocol, including the method development and validation and implementation processes, as well as revised reporting language.

Additionally, scientists from the Virginia Department of Forensic Science, where marijuana has not been legalized, collaborated with the Drug Enforcement Administration (DEA) in the development and validation phases of the project. Validation studies were performed on the 4-aminophenol color test with a variety of concentration combinations of CBD reference materials and their acids, as well as non-controlled substances. The DEA 1% assessment method was further evaluated to include GC/MS instruments with a second chromatographic column and FID. This allows comparisons of peak height and peak area data from both detectors.

In Colorado, recreational marijuana and hemp were allowed by legislation passed in 2012, known as Amendment 64. As scientists considered the draft of the 2018 Farm Bill, the Colorado Bureau of Investigation selected an instrument and developed and validated a method to quantify THC in plant materials. This workshop will describe the process and the many lessons learned in the evolving area of forensic analysis.

Marijuana, Hemp, Forensic Analysis