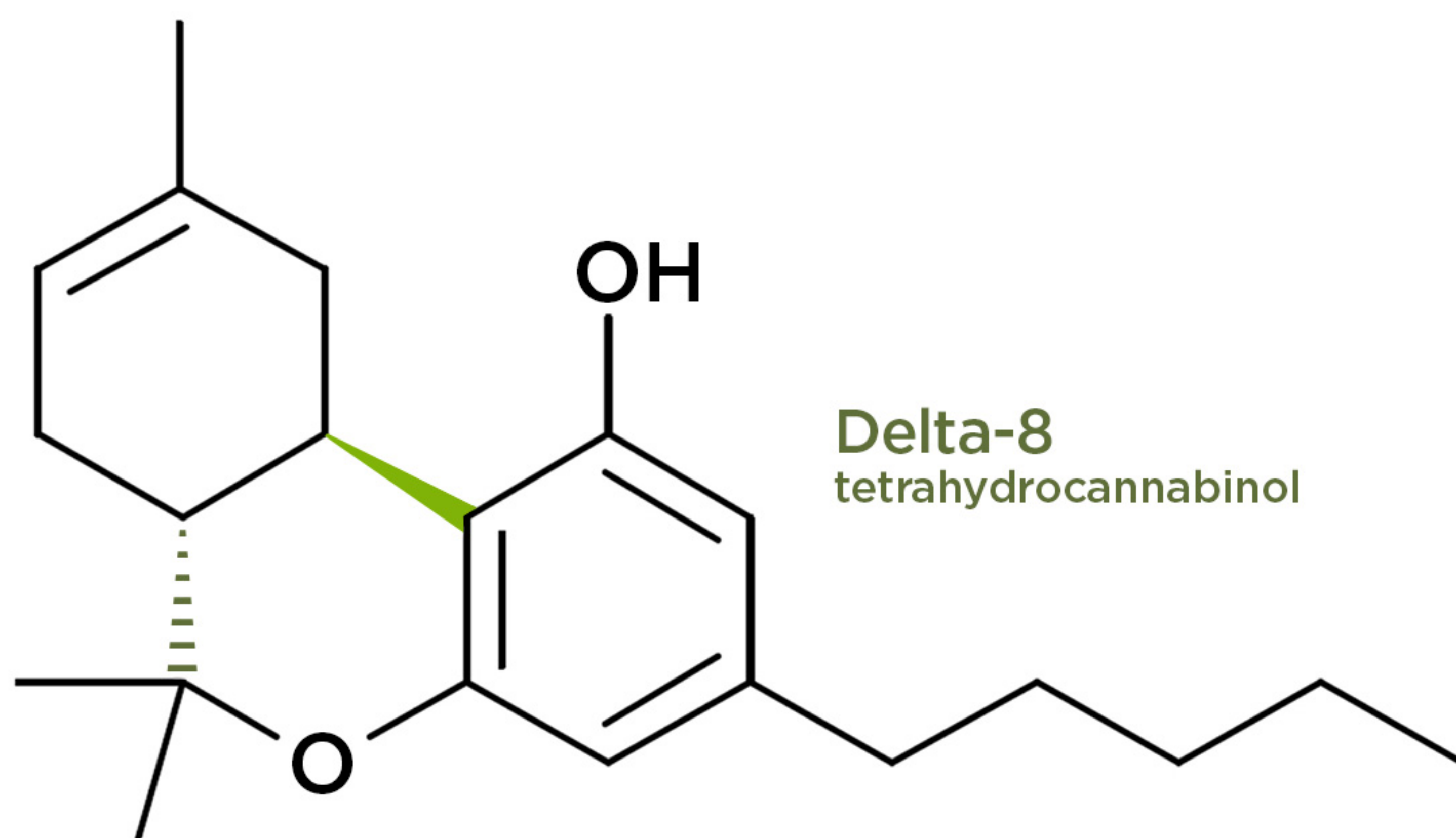




Delta-8 THC



- **It's one of the hottest substances in cannabis.**
- **Consumers clamor for it.**
- **Producers are rushing it to market.**
- **Public sector wants to understand it.**

Delta-8-Tetrahydrocannabinol (delta-8-THC, $\Delta 8$ -THC)

It's one of the hottest substances in cannabis. Consumers clamor for it, producers are rushing it to market, the public sector wants to understand it, and it may or may not be legal in the first place.

Delta-8-Tetrahydrocannabinol (Delta-8 THC) is close kin to Delta-9 THC, the compound that has been the focus of cannabis markets and public policy for decades. Strictly speaking, Delta-8 THC is an isomer of Delta-9 THC. It's produced en masse by synthetic conversion from hemp-derived CBD. The legality of Delta-8 THC is murky, and its status lies in this question: Does the hemp-based production methodology of Delta-8 THC clear the way for its legality under the 2018 Federal Farm Bill which sanctioned hemp markets throughout the US? There are differing opinions.

Dubious legal status aside, Delta-8 THC has also been challenging the cannabis industry from a scientific point of view. Simply put, many cannabis analytical services have a difficult time deciphering between Delta-8 THC and Delta-9 THC in the laboratory. The analytical challenge with these compounds is a direct result of their isomerization. These compounds only differ in a single atom placement and can therefore easily undergo conversion during chemical processing, resulting in isolation difficulties. The challenge for analytical scientists lies in the accurate resolution, identification, and quantitation of these closely related structural isomers. Some laboratories can do it; some cannot.

So why are some laboratories providing accurate THC analysis while others are not? It comes down to the sophistication of a laboratory's analytical methodologies. To be clear, cannabis laboratories across the US offer a wide range of scientific sophistication. While it's in the best interest of all cannabis producers to rely on the most accurate analytics available, differing laboratory guidelines from state to state, and no requirements around personnel and analytical techniques at the federal level, make this a challenge.





Delta-8 / The Methodology

There are a number of different ways to analyze unknown substances for the potency of various cannabinoids. The most common and widely accepted analytical methods for cannabinoid potency analysis are chromatography (liquid and gas), and mass spectrometry. Some in the industry have theorized that one particular chromatographic method is more accurate than another for the purposes of analyzing THC content (liquid over gas chromatography, or vice versa). This is false.

No matter the analytical methodology and technique used, the final result of cannabinoids present and their corresponding concentration, should be the same. The chemical composition of any substance should not yield varying results under different and properly validated analytical techniques. If an analytical technique is not yielding accurate results that agree with any and all others validated to test the same compounds, then the technique is not properly validated.

Validation of analytical laboratory techniques should be extensive and specific, with the final validated assay giving true and accurate results with little possibility for false positive and/or negative results. Poorly validated methods yielding false positives and negatives is one of the leading problems in the cannabis laboratory industry. It leads to heavy disagreement in the accurate and true analytics of cannabis products. Delta-8 THC is at the forefront of this disunion due to its isomerization with Delta-9 THC, which is federally scheduled.

Accurate resolution of structural isomers can be tricky from an analytical standpoint. Mass spectrometry, the gold standard in confirmatory unknown compound analysis, cannot resolve structural isomers. The mechanism behind mass spectrometry analysis is dependent on the molecular mass of a compound. Structural isomers share the same molecular mass. Thus, compounds as closely related as Delta-8 and Delta-9 THC cannot be resolved using mass spectrometry alone. When mass spectrometry cannot resolve two compounds due to mass and structural similarities, chromatography is the best way to resolve those compounds with accuracy and specificity.



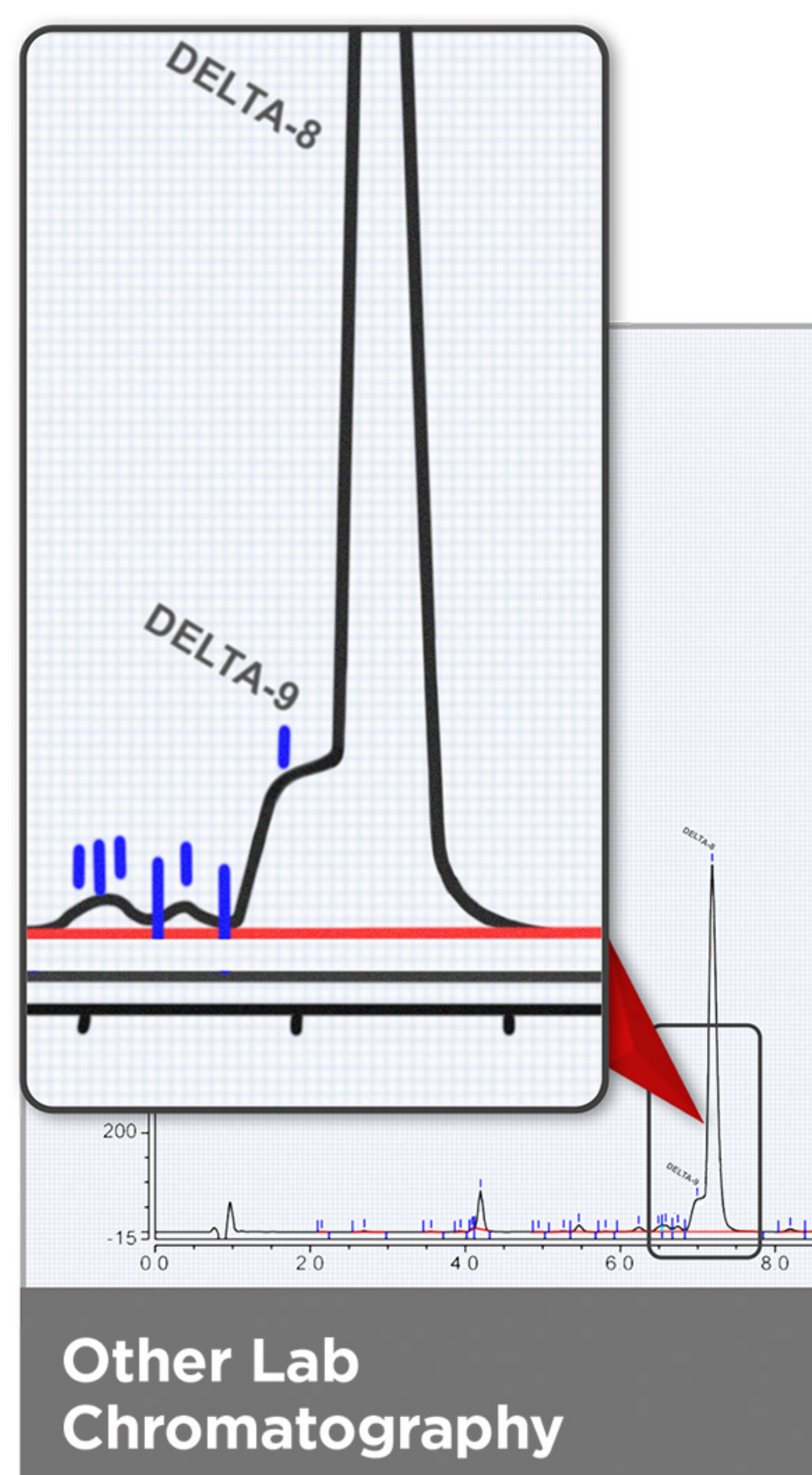


Delta-8 / Analysis

Chromatographic separation of isomers and enantiomers (compounds that exist in two mirror image forms in nature) has been widely accepted and tested over time. For instance, separation of the enantiomers of methamphetamine with chromatography has been utilized in clinical laboratory settings for over a decade. With sophisticated chromatographic analysis, law enforcement has the ability to determine legal versus illegal methamphetamine presence. This type of chromatographic resolution is what is required for closely related structural isomers like Delta-8 and Delta-9 THC.

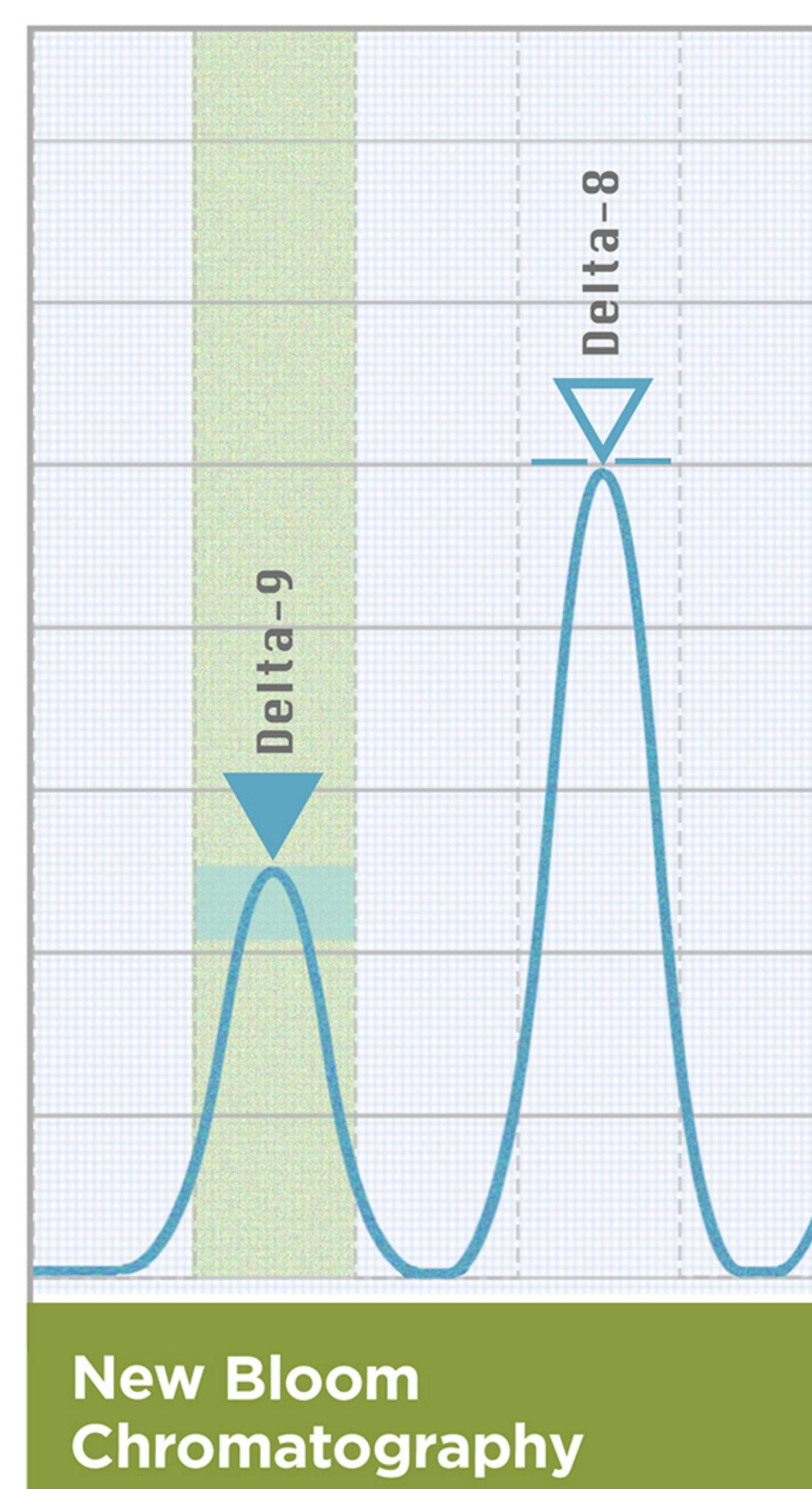
Any chromatographic chemical analysis of cannabinoids should produce clear, easily resolved signals that require very little human interpretation. Your cannabis analytics laboratory should be able to produce clearly resolved chromatography for all cannabinoids they publish. Isomers such as Delta-8 and Delta-9 THC are no exception. They should produce clear and independent signals, as is demonstrated below.

First, let's take a look at what poor analysis looks like.



- Lumpy peaks
- Poor separation
- Difficult to resolve
- Requires too much human interpretation

Now, look at the chromatography that New Bloom Labs method yields.



- Clear defined peaks
- Precise separation
- Clear resolution
- Requires very little interpretation

Again, the differences in the resolutions of these chromatographs comes down to the sophistication of the respective analytical methods.



Delta-8 / Conclusion

The current challenges around Delta-8 THC in the hemp industry are a direct result of the differing analytics that laboratories publish. Accuracy in analytical reporting comes with serious financial implications for producers. The legal and public safety consequences are significant as well.

Whether it be target reporting or unsophisticated methodologies that lead to inaccurate analytics, these poor laboratory practices put hemp producers, distributors, retailers, and consumers at serious legal risk. Peak shouldering and broadening, along with other indicative chromatographic yields, should be apparent and unacceptable to any laboratory conducting analysis on cannabis material. Laboratories choosing to ignore chromatographic indications of the presence of Delta-9 THC in Delta-8 products are publishing false negative analytics. The implications for customers of these substandard laboratory techniques can be grave. Moreover, end-use consumers could unknowingly be ingesting products containing a federally controlled substance with narcotic side effects.

Laboratories that are not properly validated and may be unknowingly reporting false negative or erroneously low results for the presence of a scheduled substance create the same risk. New Bloom Labs recommends that all entities along the Delta-8 supply chain ask pointed questions around the analytical results associated with any intermediate substance or consumer product, to include disclosure of the raw chromatography. Laboratories should always be willing to disclose this data around their publications in a timely manner.

Our primary mission at New Bloom Labs is to provide ethical analytical reporting that promotes consumer safety and reduced legal concern in the novel cannabis industry. We support the creation of higher standards of laboratory accountability that would promote these goals across all sectors of the industry, and up and down the cannabis supply chain.