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Colorado Cannabis Labs Show Inconsistent THC Potency, Study Says

Colorado Cannabis Labs Found to Produce ‘Staggeringly Unreliable’ THC Potency Results

Study Finds THC Potency Results Vary by as Much as 38%, Far Exceeding State Limits
Colorado cannabis testing labs are producing wildly inconsistent results for THC potency, with identical samples showing differences of up to 38% more than double what state law allows, according to a new report.

That’s one of the “staggeringly bad” findings from a small-scale study conducted by Ripple, a Boulder-based cannabis manufacturer, whose results were released Monday.

The study reveals significant flaws in the state’s cannabis testing system and raises new concerns about the reliability of THC potency labels that drive consumer purchasing decisions in the U.S. cannabis market.

Ripple Calls for Stricter Standards for Cannabis Testing Labs
Ripple’s leadership says the results underscore the urgent need for stronger testing protocols and consistent oversight similar to what exists in the alcohol industry.

“These results show a rot much deeper than interlab consistency,” said Justin Singer, Ripple’s CEO, in a statement.

“The same labs applying the same methods to the same samples across time are also failing to replicate results,” he added.

Ripple argues that regulators must establish stricter, standardized methods for cannabis testing laboratories to restore credibility in potency labeling and protect consumers.

THC Potency Should Allow for Variation But Not This Much

Much like alcohol content listed on beverage labels, THC potency is meant to fall within a small acceptable range.

In Colorado, state law allows a 15% variance. This means an edible labeled as containing 10 milligrams of THC may actually contain anywhere from 8.5 mg to 11.5 mg and still be compliant.

But the Ripple study found differences more extreme than that, suggesting the current testing system is failing to deliver accurate results.

“When potency swings by up to 38% between labs, the promise of ‘regulated like alcohol’ rings hollow,” the company wrote in its Potency Variability white paper.

Testing the Same Samples, Different Results Every Time

Ripple submitted six blinded samples of cannabis flower, concentrates, and gummies to six of Colorado’s seven licensed cannabis testing laboratories between November 4 and December 9, 2024.

The results revealed huge inconsistencies:

- One cannabis flower sample tested at 15.8% THC at one lab and 22.8% THC at another, a difference of over one-third.
- The same sample tested at the same lab over time also varied significantly—from 17.9% to 22.8% THC.

Similar issues appeared with concentrates and edibles, products expected to have uniform potency. One concentrate sample tested between 36.5% and 46.5% THC at different labs, and a single lab’s repeated tests produced a spread from 36.5% to 47%.

“These findings are not just statistical noise,” Ripple stated. “They indicate systemic flaws in the way cannabis potency is being measured and reported.”

Why THC Testing Variability Matters for Consumers and the Industry

Inconsistent potency testing doesn’t just confuse consumers—it threatens the credibility of the legal cannabis industry as a whole.

Many consumers rely on THC numbers as a measure of quality, paying premium prices for products labeled with higher potency. But if those figures are inaccurate, both consumers and businesses are being misled.

“Consumers believe they’re getting a more potent product when they’re really buying into a number that might be inflated or meaningless,” Singer said.

The issue also impacts taxation, regulatory compliance, and brand trust especially as cannabis businesses face tighter margins and increased competition.

A Broader Industry Pattern: Potency Inflation and Testing Pressure

The Colorado study is not an isolated case. Across the U.S., concerns over “lab shopping”—where producers seek out testing facilities that deliver higher THC results have become widespread.

Ripple’s earlier analysis released in February 2024 found that up to 85% of products sold in Colorado might violate state labeling rules due to potency discrepancies.

Similarly, a University of Colorado study published last summer found evidence of THC inflation, suggesting that cannabis flower often tests higher in THC potency than is chemically possible based on cannabinoid content.

Labs Under Pressure and Regulators Under Scrutiny

Industry critics say the core issue lies in how the market incentivizes labs to deliver high THC results.

“Producers know consumers chase numbers, and labs that don’t give high readings lose clients,” one Colorado cannabis analyst told MJBizDaily in an earlier report.

This dynamic, combined with limited regulatory oversight and inconsistent testing methodologies, has created what Ripple describes as “a systemic failure of trust.”

Ripple’s study suggests that state regulators must implement standard reference materials, cross-lab audits, and blind proficiency testing—similar to quality control measures in the alcohol and pharmaceutical industries.

The Path Forward: Standardization and Consumer Trust

While Colorado’s cannabis market remains one of the most mature in the nation, the study highlights a growing credibility crisis that could undermine its leadership role.

To rebuild trust, Ripple and other industry leaders are urging state regulators to introduce mandatory calibration programs, tighter accreditation standards, and transparent public reporting of lab performance.

Singer concluded, “The cannabis industry can’t continue to grow on a foundation of unreliable science. The future of legal cannabis depends on consumers being able to trust what’s on the label.”

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