Homogenization of THC in Edible Marijuana Products

As with other staff reports, available research was not restricted to "medical" marijuana.

Kinds of edibles

Liquid beverages such as tea, energy drinks, juice
Baked items such as bars, brownies and cookies
Candies such as hard candy, chocolates and gummies

State Requirements: WA and CO

Daria Serna, Colorado Department of Revenue spokesperson said, "Potency testing measures the value of THC in a product, and it also determines if the THC is homogenized in the product." Colorado began mandatory testing of edibles in May, 2014.

Colorado requires that every Production Batch of Retail Marijuana Product be tested for potency. Potency tests must determine the level of concentration of the required cannabinoids and whether or not THC is homogenously distributed. For Single-Serving Edible Retail Marijuana Product, processes may be validated for homogeneity and potency. To maintain a validated process, production facilities must submit passing samples on a quarterly basis.

The State of Washington touts that marijuana edibles sold in Washington "must be homogenized throughout the product, so that it is evenly distributed, and serving sizes must be marked or scored on the product."
Factsheet: "Learn about Marijuana: Science-based information for the public. Alcohol and Drug Abuse Institute, University of Washington. 9/24/2015.

WAC requires "intermediate products" to be homogenized (WAC 314-55-102 Quality assurance testing. 8,b,i)

Intermediate Product (def). Flower lots or other material lots that have been converted by a marijuana processor to *a marijuana concentrate or marijuana-infused product that must be further processed prior to sale.*

Intermediate Product Tests include, depending on the product, moisture content, potency analysis, foreign matter inspection, microbiological screening, and residual solvent test.

Washington requires "quality assurance" testing for retail-ready products which amounts to Potency Analysis. Potency Analysis is required of infused solid edibles, infused liquids, infused topicals, marijuana mix (loose or rolled), and concentrates or marijuana-infused products for inhalation.

Chemical issues with even distribution

A Colorado producer discusses variability in his edible products: "Because our hash is cold-water extracted, it's particalized. It's not like an oil like butane or CO2. So if you have the medicine sitting, the

particles could fall to the bottom. So somebody could get a high-potency product and somebody could get a low-potency product."

On medicaljane.com, the article *Cooking with Cannabis: How to Put Marijuana in Edibles* indicates that once a cannabinoid hits its boiling point it vaporizes and is eliminated from the product. Different cannabinoids have different boiling temperatures; as such, slight variations in process can produce varying effects.

Back to kinds of edibles:

Liquid beverages such as tea, energy drinks, juice:
Many believe that these products are likely the easiest edible where homogeneity can be counted on because an individual will probably consume the entirety of contents. Yet since many concentrates are somewhat oily, and oil is known not to mix with water, one should "shake well before using."

Baked items such as bars, brownies and cookies:
Many believe homogeneity becomes a problem with these products for chemical reasons related to thermodynamics and particalization mentioned above.

Candies such as hard candy, chocolates and gummies:
Many believe that these products can be individually dosed with a precisely measured microdrop application of active ingredients. Evidence of these precise processes and whatever equipment they might require remains to be seen.

For medicinal benefits, it's not just about the THC. Nevada requires potency analysis of 4 cannabinoids including THC and 10 terpenoids. This is important for patients who look to match profiles to symptomatic relief.

See Nevada DPBH article "Medical Marijuana Patients: Play it Safe and Don't Eat the Whole Cookie!"