

MJBiz[™]

Science
SYMPOSIUM



Homogenizing Cannabis to Maintain Clean Products with Accurate Potency



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Homogenized mixtures are a blend of diverse elements so they are the same throughout.

Types of Homogenized Mixtures Include:

- Flower: big & small buds
- Pre Roll: cannabis blends
- Vapes: distillate & terpenes
- Topicals: actives & vehicle
- Edibles: cannabinoids & food ingredients





The process of homogenization is **necessary** for getting your product to market

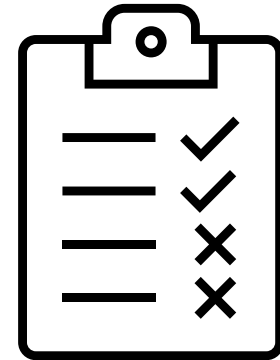
- Required for Compliance
- Accurate Batch Representation
- Prevent Rework
- Maximize Production

Homogenization is required by most compliance regulations



Master Manufacturing Protocol

- SOP for even distribution of cannabinoids
- Traceability of every production step
- Batch Sign off
- Proper Training



Label Claim must be within 10% of COA



- Potency can change throughout production
- Save time & prevent re-stickering
- Retain brand integrity

Passing compliance & problem solving

Walk through with your 3rd party lab

- Replicate their process
- Confirm sample prep & homogenization SOPs

Tracking forms

- Traceability
- Accountability

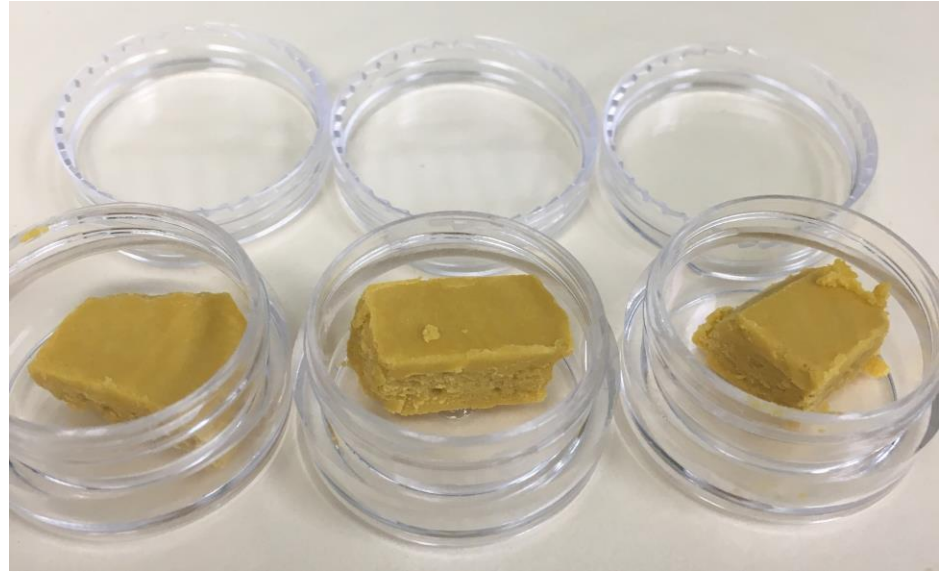
Accurate batch representation when procuring material

- Price Negotiation
- Remediation Planning
- Validate your purchase



Accurate Batch Representation throughout production

- Identify Root Cause
- Production Planning
- Product Development



Homogenization is Necessary for Creating Successful Products

- Product Consistency
- Ingredient Control
- Functionality



Consistent texture is ideal for production

- Maximize Production

- Increase Speed
- Reduce Rejects
- Maintain Quality Control
- Minimize Scrap
- Prevent equipment from clogging



Become familiar with your ingredients

- Flower
- Terpenes & Flavoring
- Cannabinoids
- Stabilizers
- Vehicles

Types of Ingredients



- Viscosity
- Temperature influence
- Texture
- Size
- Order of addition

Characteristics



Consistent products create loyal customers

- Repeatable Experience
 - Flavor
 - Effect
 - Function
 - Visual Presentation
 - Rate of onset
 - Duration



The Process of Homogenization

- Biomass
- Extracts
- Samples



Homogenizing biomass

Types of biomass



- Flower
- Trim
- Fresh Frozen

Breaking down the batch



- Lot size 1 lb to +10,000 lbs
- Bag size up to 500 lbs
- Create sub batches for greater accuracy

Tools to homogenize biomass

- Sorting Tables
- Sifting
- Vibration
- Mixers
- Extraction



Why homogenize biomass if it's from the same *farm*?

Location in room varies:

- Light
- Temperature
- Humidity
- Air flow
- Pesticide drift from neighboring farms



Why homogenize biomass if it's from the same *plant*?

- THC can vary over 10% difference between big and small buds
- Higher concentrations of pesticides can be found in certain parts of the plant



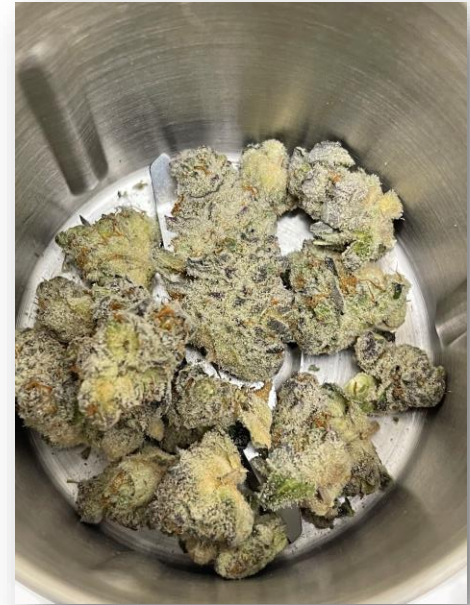
How reducing particle size can help



- Equal distribution of trichomes & other plant matter
- Larger sample size is more accurate
- Maximize THC results
- Easier to homogenize

Sample Prep can help guide production

- Control THC of blends
- Avoid unexpected results
- Predict extraction & production yields



Homogenizing extracts

Types of extracts

- Crude Oil
- Distillate
- Vape Oil
- Isolate
- Terpenes
- Other Concentrates

Variables to consider:

- Temperature
- Viscosity
- Type of container
- Dilution



Hot Spots exist but can be eliminated

- Homogenizing the entire batch in 1 container
- Control parameters during production
- Review process
- Pull multiple samples from different areas
- Pull core samples



Homogenizers used for extracts

Equipment

- Overhead Stirrer
- Jacketed Reactor
- Magnetic Hot Stir Plate
- Bladeless Mixer
- Stainless Steel Utensil

Consider These Factors:

- Temperature Control
- Speed
- Efficiency
- Transfer Loss
- Space



Validating homogenization techniques



- Test & compare samples from multiple areas of the batch
- Validate when introducing new:
 - Equipment
 - Tools
 - SOPs
 - Ingredients
 - Employees
 - 3rd Party Labs

In house analytics improves homogenization

- NIR (Near Infrared)
- TLC (Thin Layer Chromatography)
- Microscope
- HPLC (High Performance Liquid Chromatography)



Research & Development

- Experiment with new ideas
- Hire a consultant
- Talk with industry vendors
 - Cannabis
 - Food
 - Pharmaceutical
 - Industrial
 - Cosmetic



Questions?



Thank you!



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