

# DECARBOXYLATION GUIDE

Cannabis Product Analysis: Combustion, Vaporization & Oral Consumption

March 2026

This guide breaks down exactly what happens to THC across three consumption methods — smoking, vaping, and eating — using real products as examples. It also includes a complete, step-by-step Instant Pot decarboxylation method with the science behind every decision. Every number comes from the manufacturer label, every calculation shows its work, and every claim cites published pharmacokinetic research.

**Pricing Context:** All prices were collected in Spring 2026 from a licensed cannabis dispensary in San Diego, CA. The two brands featured as examples are **Raw Garden** and **Box Lunch**.

**Verification:** All data double-checked by Gemini 3.1 Pro and triple-checked by Gemini 3 Flash (both with web search). Report compiled by Claude Opus 4.6.

**Data Source:** Product data transcribed directly from manufacturer packaging labels and verified against original photographs.

# SECTION 1: PRODUCT DATA

Three products represent the three major consumption categories: raw flower (which can be smoked or decarboxylated for edibles), a refined live resin vape cartridge, and an infused pre-roll joint. Together, they cover combustion, vaporization, and oral ingestion — the three pathways THC can take into the body.

## Product 1: Box Lunch — Sativa-Dominant Hybrid Fine Cut Flower

A half-ounce bag of Blue Dream — one of the most widely recognized sativa-dominant hybrid strains in California. At 28.9% THC, this flower serves as both the combustion example and the raw material for our decarboxylation analysis.

Field	Value
Brand	Box Lunch
Product Type	Fine Cut Flower
Strain	Blue Dream
Classification	Sativa-Dominant Hybrid
Net Weight	14g (1/2 oz)
THC	28.9%
CBD	0.2%
Total Cannabinoids	29.4%
Batch ID	PB-011926-BD-FCC-S
SRC PKG (UID)	1A4060300046B41000022267
PKG Date	01/19/2026
Listed Price	\$25.00 (tax-included, per dispensary pricing)

## Product 2: Raw Garden — All-In-One Vape (Refined Live Resin)

A single-gram disposable vape containing 815mg of activated THC in refined live resin form. Because the extraction process already converts THCa to THC, this product is ready to inhale with no preparation required.

Field	Value
Brand	Raw Garden
Product Type	All-In-One Vape, Refined Live Resin
Strain	Ze Chem
Classification	Sativa
Flavor Profile	GAS
Net Weight	1g / 0.035 oz
Total THC	815.0 mg
Total CBD	2.1 mg
All Cannabinoids	83.5%
Lot/Batch ID	250001396
UID	1A4060300002EE1000090112
MFG/PKG Date	10/07/2025
License	CCAP, LLC - DCC-10003156
Ingredients	100% Cannabis
Usage	Pre-heat, Inhale, Enjoy. Plug In USB-C To Recharge.
Listed Price	\$40.00 (pre-tax sticker)

## Product 3: Raw Garden — Live Sauce Infused Joint

A single pre-rolled joint infused with live sauce concentrate, boosting its THC content well beyond what raw flower alone could deliver. At 26.5% Total THC and 2.2% terpenes, this hybrid represents the middle ground between pure flower and concentrated oil.

Field	Value
Brand	Raw Garden
Product Type	Single Joint, Live Sauce Infused
Strain	Raspberry Haze
Classification	Hybrid
Flavor Profile	BERRY
Net Weight	1g / 0.035 oz

Field	Value
Total THC	280.9 mg
Total THC %	26.5%
THCa	184.4 mg
Total CBD	<2.0 mg
Terpenes	2.2%
Lot/Batch ID	250001510
UID	1A406030001818D000074476
MFG/PKG Date	11/12/2025
License	CCAP, LLC - DCC-10003156
Ingredients	100% Cannabis
Usage	Ignite, Inhale, Enjoy.
Listed Price	\$15.00 (pre-tax sticker)

# SECTION 2: CALIFORNIA CANNABIS TAX ANALYSIS

Cannabis in California is taxed twice at the register — once by a cannabis-specific excise tax, and again by standard sales tax. These stack on top of each other, creating a combined markup that significantly affects out-the-door pricing. Understanding this structure helps explain why the sticker price and the receipt total can look so different.

## 2.1 — Tax Components

Tax Component	Rate	Authority
CA State Cannabis Excise Tax	19%	Effective July 1, 2025 (CDTFA L-979)
CA State Sales Tax	6.00%	State base rate
San Diego County Sales Tax	0.25%	County increment
Local / District Sales Tax	1.50%	City and special district
Combined Sales Tax	7.75%	Sum of above three

**Excise Tax Disclaimer:** AB 564 may have rolled the CA cannabis excise tax back to 15% effective October 2025. Buyers should confirm the current rate with CDTFA or their dispensary.

## 2.2 — Effective Combined Tax Rates

Because sales tax is calculated on the price after excise tax has already been added, the two taxes compound rather than simply adding together.

Excise Rate Scenario	Calculation	Effective Markup
19% excise	Base x 1.19 x 1.0775	28.22%
15% excise (if AB 564)	Base x 1.15 x 1.0775	23.91%

## 2.3 — Tax Breakdown Per Product (19% Excise)

Product	Pre-Tax	Excise (19%)	Subtotal	Sales Tax (7.75%)	Out-the-Door
Box Lunch Flower	<del>(\$19)</del> 50	\$3.71	\$23.21	\$1.80	\$25.00
Raw Garden Vape	<del>(\$40)</del> 0.00	\$7.60	\$47.60	\$3.69	\$51.29
Raw Garden Joint	<del>(\$15)</del> 0.00	\$2.85	\$17.85	\$1.38	\$19.23

# SECTION 3: THC CONTENT ANALYSIS

Raw cannabis flower does not actually contain THC — it contains THCa, the acidic precursor. Heat converts THCa into the psychoactive Delta-9-THC through a process called decarboxylation. This conversion is not 1:1, because removing the carboxyl group (a molecule of CO<sub>2</sub>) reduces the molecular weight. Understanding this chemistry is essential for accurately calculating how much active THC any given product can deliver.

## 3.1 — Decarboxylation Chemistry

Parameter	Value
THCa Molecular Weight	358.48 g/mol
Delta-9-THC Molecular Weight	314.47 g/mol
Conversion Factor	$314.47 / 358.48 = 0.877$
Mechanism	Loss of CO <sub>2</sub> carboxyl group
Decarb Efficiency (proper technique)	95-100% (method-dependent; see Section 4)

When decarboxylation is done correctly — low and slow, within the 220–245°F range — approximately 95–100% of the THCa converts to active THC. Overheating beyond this window risks degrading THC further into CBN, a much less psychoactive cannabinoid associated with sedation. The next section covers methods for achieving this conversion, including a conventional oven and an Instant Pot pressure cooker. There is also a well-known alternative oven approach summarized by the easy-to-remember rule “**90 at 90**” — 90°C (194°F) for 90 minutes — which uses a lower temperature and longer time to achieve the same result with a wider margin of safety against CBN degradation.

## 3.2 — THC Content by Product

Metric	Flower (14g)	Vape (1g)	Joint (1g)
THC % (label)	28.9%	N/A	26.5%
Raw THCa (mg)	4,046	N/A (pre-activated)	184.4
Theoretical THC (x0.877)	3,548	815.0 (label)	280.9 (label)
THC at 97% decarb efficiency	3,442	N/A	N/A

# SECTION 4: INSTANT POT DECARBOXYLATION METHOD

The conventional oven method works — but it has drawbacks: temperature fluctuations, strong odor, and the constant risk of accidentally overheating. The Instant Pot pressure cooker method solves all three problems by leveraging the physics of saturated steam to lock the temperature at exactly the right point. It takes longer, but it is virtually foolproof. Here is the complete procedure and the science behind every step.

## 4.1 — Step-by-Step Procedure

The entire method uses three pieces of equipment: an Instant Pot (or similar electric pressure cooker), its included steamer trivet/rack, and a standard Ball or Kerr mason jar with a two-piece lid (flat lid with rubber gasket + threaded retaining band).

Step	Action	Details	Time	Temp
1	Prepare the Cannabis	Break or coarsely grind the flower into roughly uniform pea-sized pieces. Do not grind into fine powder. Place into a clean, dry mason jar.	5 min	Room
2	Seal the Jar	Place the flat lid (rubber gasket side down) on the jar. Screw the threaded band on until you meet natural resistance, then stop. This is "finger-tight." Do NOT torque it down.	1 min	Room
3	Prepare the Instant Pot	Place the metal trivet/steamer rack into the bottom of the Instant Pot. Pour in approximately 1 inch of water — enough to generate steam but staying below the rack level.	2 min	Room
4	Load the Pot	Place the sealed mason jar centered on the trivet. Ensure it is stable and will not tip or slide into the water if the pot is jostled.	1 min	Room
5	Pressure Cook	Lock the Instant Pot lid. Set valve to "Sealing." Select Manual/Pressure Cook on HIGH PRESSURE. Set timer to 3 hours (180 minutes). Walk away.	3 hours	Ramping to ~240°F
6	Natural Pressure Release	When the timer finishes, do NOT touch the valve. Allow the Instant Pot to depressurize naturally until the float pin drops on its own. This prevents thermal shock to the glass jar.	20–30 min	Gradually cooling

Step	Action	Details	Time	Temp
7	Cool and Store	Using canning tongs or silicone oven mitts, carefully remove the jar. Let it sit unopened at room temp until completely cool. This allows vaporized terpenes to re-condense onto the plant material.	45–60 min	Cooling to room temp

**Total elapsed time:** Approximately 4–4.5 hours (including pressurization ramp-up, the 3-hour cook, natural release, and cooling). Active hands-on time is under 10 minutes.

## 4.2 — Why the Instant Pot Works: Temperature Science

A pressure cooker does not cook with hot air like an oven — it cooks with saturated steam under pressure. The laws of thermodynamics dictate that at a given pressure, water can only boil at one specific temperature. This means the temperature inside a sealed Instant Pot is physically locked by the pressure setting, not by a thermostat that cycles on and off.

Parameter	Value
Instant Pot "High Pressure" PSI	10.15–11.6 PSI above atmospheric
Steam Temperature at 10.15 PSI	239.4°F (115.2°C)
Steam Temperature at 11.6 PSI	243.1°F (117.3°C)
Mean Operating Temperature	~240°F (115.6°C)
Ideal Decarb Window	220–245°F
Temperature Stability	±2°F (saturated steam physics)
Oven Temperature Stability	±15–20°F (thermostat cycling + hot spots)

The ~240°F operating temperature sits precisely in the center of the ideal decarboxylation window. Because the temperature is governed by the pressure of saturated steam rather than a thermostat, it cannot overshoot — making it physically impossible to accidentally degrade THC into CBN through overheating.

## 4.3 — The Mason Jar: Engineering and Physics

The mason jar is not just a container — it is a precision pressure vessel. Standard Ball and Kerr canning jars are engineered for exactly this kind of environment: high temperature, high pressure, and thermal cycling. The two-piece lid system is the key to the entire method.

Parameter	Detail
Jar Material	Annealed soda-lime glass (Ball/Kerr)
Temperature Rating	Up to 250°F (121°C) — designed for pressure canning
Thermal Shock Limit	Max sudden $\Delta T$ of ~70°F (gradual heating in IP is safe)
Flat Lid Gasket	Plastisol rubber compound; softens above 140°F
Gasket at 240°F	Highly malleable — conforms to jar rim, forms hermetic seal on cooling
Threaded Band Function	Holds flat lid in place; does NOT create the seal itself

**Why "finger-tight" is critical:** When the jar heats up, the air and CO<sub>2</sub> released by decarboxylation expand inside the jar. A finger-tight seal allows the flat lid to lift

microscopically against the softened gasket, venting this excess pressure outward — preventing the jar from shattering. At the same time, the ambient steam pressure in the pot pushes down on the lid, and the softened gasket blocks external moisture from entering. The result: expanding gases can escape, but steam cannot get in. If the band is screwed on too tight, internal pressure has no escape route and the jar can crack or explode. If it is too loose, steam bypasses the gasket and soaks the cannabis.

### 4.4 — Why 3 Hours? The Heat Transfer Explanation

The oven method takes 30–45 minutes because hot air contacts the cannabis directly. The Instant Pot method takes 3 hours because heat must travel a much longer path to reach the plant material inside the jar.

Heat Transfer Stage	Medium	Conductivity	Notes
1. Heating element → Water	Direct contact	High	Water heats to boiling rapidly
2. Water → Steam	Phase change	Very High	Latent heat of vaporization = 970 BTU/lb
3. Steam → Glass jar exterior	Condensation	Very High	Steam $h \approx 10,000 \text{ W/m}^2\text{K}$ vs. air $h \approx 25 \text{ W/m}^2\text{K}$
4. Glass jar wall	Conduction	Low	Glass $k \approx 1.05 \text{ W/mK}$ (insulator)
5. Air inside jar	Convection	Very Low	Static air $k \approx 0.026 \text{ W/mK}$
6. Air → Cannabis	Conduction	Low	Dry plant matter is a poor conductor

Despite these insulating layers, the saturated steam environment transfers heat far more efficiently than dry oven air. It takes approximately 15–25 minutes for the core of the cannabis inside the jar to reach the ~240°F target temperature. Once at temperature, the effective decarboxylation window is roughly 60–90 minutes for complete conversion. The 3-hour setting provides generous margin: ~20 minutes for heat-up, ~90 minutes at target temperature, and substantial additional insurance for dense or slightly moist material.

## 4.5 — Decarboxylation Efficiency: Instant Pot vs. Oven

The Instant Pot method achieves exceptionally high conversion rates — not because the temperature is higher, but because the temperature is more consistent and the sealed environment reduces oxidative degradation.

Metric	Oven Method	Instant Pot Method
Temperature	220–245°F (set)	~240°F (physics-locked)
Actual Temp Stability	±15–20°F	±2°F
Duration	30–45 minutes	3 hours (180 minutes total)
Effective Time at Target	30–45 min (if oven is accurate)	60–90 min (after thermal lag)
Expected THCa → THC Conversion	~70% (under ideal conditions)	95–100%
CBN Formation Risk	Moderate (oven hot spots)	Very Low (temp ceiling + low O <sub>2</sub> )
Primary Failure Mode	Overheating → CBN degradation	None typical (method is self-regulating)
Skill Level Required	Moderate (must monitor oven)	Low (set and forget)

The sealed mason jar also creates a naturally low-oxygen environment. As decarboxylation proceeds, the CO<sub>2</sub> released by the reaction displaces atmospheric oxygen inside the jar. Since THC-to-CBN degradation is accelerated by oxidation, this reduced-oxygen atmosphere provides an additional layer of protection that open-tray oven methods cannot match.

**Note — The “90 at 90” Oven Alternative:** A commonly cited oven method uses 90°C (194°F) for 90 minutes. This lower-temperature approach sits further from the CBN degradation threshold, giving a wider safety margin against overheating. The trade-off is slightly longer time and potentially incomplete conversion in ovens with poor temperature accuracy. This guide does not cover the specifics of the 90-at-90 method beyond acknowledging it as a valid, easy-to-remember tactic.

## 4.6 — Terpene Preservation Advantage

One of the most significant advantages of the Instant Pot method is terpene retention. In an oven, volatile monoterpenes (like myrcene and limonene) evaporate off the tray and are lost to the kitchen air. In a sealed mason jar, these terpenes vaporize but have nowhere to go — they remain in the headspace above the cannabis and re-condense onto the plant material as the jar cools.

Terpene Class	Boiling Point Range	Oven Survival	Instant Pot Survival
Monoterpenes (Myrcene, Limonene, Pinene, Terpinolene)	310–350°F (154–177°C)	30–50% (evaporate into oven air)	70–85% (trapped in jar; re-condense on cooling)
Sesquiterpenes (Beta-Caryophyllene, Humulene)	390–430°F (199–221°C)	70–90% (higher BP = better survival)	>95% (well below BP; sealed environment)

The Instant Pot method preserves an estimated 40–60% more volatile terpenes than an open-tray oven decarb. For users who value the entourage effect — the synergy between cannabinoids and terpenes — this is a meaningful advantage.

## 4.7 — Safety Considerations

Safety Item	Why It Matters
Use proper canning jars <b>ONLY</b>	Ball, Kerr, or equivalent annealed glass jars rated for pressure canning. Never use repurposed commercial jars (pickle jars, pasta sauce jars, etc.) — they are not annealed and may shatter under pressure.
Inspect jars before every use	Any crack, chip, or scratch on the rim or body can become a fracture point under thermal stress. Discard damaged jars.
Finger-tight <b>ONLY</b>	Over-tightening prevents pressure venting and risks jar failure. Under-tightening allows steam intrusion. The band should turn with minimal finger effort — snug, not torqued.
Natural pressure release <b>ONLY</b>	Quick-release causes a rapid pressure drop inside the pot while the jar interior remains pressurized. This sudden differential can cause the jar to crack or blow its lid.
Use canning tongs or silicone mitts	Tilt the jar and its contents will be approximately 240°F when the pot opens. Never handle with bare hands or cloth towels.
Water level	Ensure at least 1 inch of water before starting. A sealed pressure cooker loses very little water to evaporation, but running dry triggers a burn error and can damage the heating element.
Let the jar cool completely before opening	Opening a hot jar releases trapped terpene vapor and also risks burns from escaping steam. Allow full cooling for best results and safety.

## 4.8 — Method Comparison: Oven vs. Instant Pot vs. Sous Vide

Three methods exist for home decarboxylation. Each has trade-offs. The following table compares them across every relevant dimension so you can choose the right one for your situation.

Dimension	Oven	Instant Pot	Sous Vide
Temperature	220–245°F (set)	~240°F (locked)	~203°F (set)
Temp Stability	±15–20°F	±2°F	±0.1°F
Duration	30–45 min	3 hours	1–4 hours
THCa → THC Conversion	~97%	95–100%	Variable (often incomplete at 203°F)
CBN Risk	Moderate (hot spots)	Very Low (temp ceiling)	Negligible (low temp)
Terpene Retention	Low (open air loss)	High (sealed jar)	Highest (zero venting)
Odor Control	Poor (fills home)	Excellent (double-sealed)	Excellent (sealed bag)
Skill Required	Moderate	Low	Low–Moderate
Equipment	Oven, sheet, parchment/foil	Instant Pot, trivet, mason jar	Sous vide circulator, vacuum sealer, bag
Hands-On Time	~10 min	~10 min	~10 min
Total Time	45–60 min	4–4.5 hours	2–5 hours

**Bottom line:** The oven is fastest. Sous vide preserves the most terpenes but often under-converts at lower temperatures. The Instant Pot strikes the best balance — near-perfect conversion, excellent terpene retention, zero odor, and a self-regulating temperature that makes it essentially mistake-proof.

**Also valid:** The “90 at 90” oven method (90°C / 194°F for 90 minutes) offers a lower-temperature alternative with a wider safety margin against CBN formation, though it is not detailed further in this guide.

## SECTION 5: VALUE ANALYSIS

Comparing products by sticker price alone is misleading — a \$25 bag of flower and a \$40 vape cartridge contain vastly different amounts of THC. Cost per milligram of THC normalizes the comparison, revealing how much active cannabinoid each dollar actually buys.

### Cost Per mg THC (Pre-Bioavailability)

Metric	Flower (14g)	Vape (1g)	Joint (1g)
Theoretical THC (mg)	3,548	815.0	280.9
OTD Price	\$25.00	\$51.29	\$19.23
Cost per mg THC	\$0.00705 (0.70c)	\$0.06293 (6.29c)	\$0.06846 (6.85c)
mg THC per \$1.00	141.9	15.9	14.6

## SECTION 6: EQUIVALENCE ANALYSIS

To put the value difference in concrete terms: how many vapes or joints would someone need to purchase to match the total THC in one 14-gram bag of flower?

Metric	Flower (14g)	Vapes to Match	Joints to Match
Units Required	1 bag	4.35 vapes	12.63 joints
OTD Cost	\$25.00	\$223.11	\$242.87
Cost Multiplier vs. Flower	1.0x	8.9x	9.7x

In other words, matching the raw THC content of one \$25 bag of flower would require spending roughly \$223 on vapes or \$243 on infused joints — nearly ten times the price for the same total cannabinoid content.

# SECTION 7: BIOAVAILABILITY

Not all THC that enters a product enters the body. Bioavailability measures the fraction of consumed THC that actually reaches the bloodstream in active form. This single variable is what separates a product's theoretical potency from its real-world effect. Combustion, vaporization, and oral ingestion each route THC through entirely different biological pathways — with dramatically different efficiency.

## 7.1 — Pharmacokinetic Ranges (Clinical Literature)

Parameter	Combustion	Vaporization	Oral
Bioavailability Range	10–25%	30–50%	4–12%
Average Bioavailability	~15%	~40%	~8%
Onset	1–3 min	1–3 min	60–120 min
Time to Peak (Tmax)	10–15 min	5–10 min	2–3 hours
Duration	2–4 hours	2–3 hours	6–8+ hours
Primary Metabolite	Delta-9-THC	Delta-9-THC	11-OH-THC
Operating Temp	600–900°C	160–230°C	37°C (body)

The gap between combustion (15%) and vaporization (40%) is largely due to pyrolysis — the cherry on a burning joint reaches temperatures that destroy a significant portion of THC before it can be inhaled. Vaporization avoids this by heating oil just enough to aerosolize it. Oral bioavailability is the lowest at 8%, but as the next sections show, the story does not end there.

## 7.2 — Absorption Applied to Products

Metric	Flower (Smoked)	Vape (Inhaled)	Flower (Oral)
THC Available (mg)	3,548	815.0	3,442
Bioavailability	15%	40%	8%
THC Absorbed (mg)	532.2	326.0	275.4
OTD Price	\$25.00	\$51.29	\$25.00
Cost per Absorbed mg	\$0.047 (4.7c)	\$0.157 (15.7c)	\$0.091 (9.1c)
Absorbed mg per \$1	21.3	6.4	11.0

## SECTION 8: COMBUSTION LOSS CASCADE

When cannabis flower is smoked, THC passes through a gauntlet of losses before reaching the bloodstream. The following table traces the full 14-gram bag of Box Lunch flower from its raw THCa content all the way to the milligrams that actually enter systemic circulation. Each stage accounts for a specific, measurable loss mechanism.

Stage	THC Remaining (mg)	Lost at Stage (mg)	Cumulative Loss
THCa in flower (raw)	4,046	—	0.0%
After decarboxylation (x0.877)	3,548	498	12.3%
After pyrolysis (~30% destroyed)	2,484	1,064	38.6%
After sidestream (~40% lost)	1,490	994	63.2%
After exhalation / incomplete absorption	532	958	86.9%

By the time smoke reaches the alveoli and crosses into the bloodstream, approximately 87% of the original cannabinoid content has been lost to heat destruction, sidestream waste, and incomplete lung absorption. This is the fundamental inefficiency of combustion as a delivery method.

## SECTION 9: 11-HYDROXY-THC & PSYCHOACTIVE EQUIVALENCE

Oral consumption has the lowest bioavailability of the three methods — yet edibles are widely reported to produce the most intense experiences. The reason lies in what the liver does to THC on its way through. When Delta-9-THC passes through the liver before reaching the brain (a process called first-pass metabolism), enzymes convert a substantial portion of it into 11-Hydroxy-THC (11-OH-THC), a metabolite that crosses the blood-brain barrier more efficiently and binds CB1 receptors with higher affinity.

### 9.1 — Hepatic First-Pass Metabolism

Parameter	Detail
Pathway	Oral Delta-9-THC undergoes hepatic first-pass metabolism
Enzymes	CYP2C9 and CYP3A4
Metabolite Produced	11-Hydroxy-THC (11-OH-THC)

Parameter	Detail
Properties	More hydrophilic; crosses blood-brain barrier more efficiently
Published Potency Range	1.5x to 7x more psychoactive than Delta-9-THC
Conservative Estimate Used	2x

## 9.2 — Psychoactive Equivalence

When the potency of 11-OH-THC is factored in, oral consumption of the same \$25 bag of flower delivers a psychoactive impact that rivals — and slightly exceeds — smoking it.

Metric	Combustion	Vape	Oral (Decarbed)
Absorbed THC (mg)	532.2	326.0	275.4
Potency Multiplier	1x (Delta-9)	1x (Delta-9)	2x (11-OH-THC)
Psychoactive Equivalent (mg)	532.2	326.0	550.8
OTD Price	\$25.00	\$51.29	\$25.00
Psychoactive Units per \$1	21.3	6.4	22.0

## SECTION 10: TERPENE DATA

Terpenes are the aromatic compounds responsible for the distinct smell and flavor of each cannabis strain. Beyond sensory experience, terpenes are lipophilic molecules small enough to cross the blood-brain barrier, where research suggests they modulate cannabinoid receptor activity — a phenomenon known as the entourage effect. How many terpenes survive the journey from product to bloodstream depends heavily on the consumption method.

Parameter	Combustion	Vaporization	Instant Pot Decarb
Terpene Survival Rate	30–50%	70–90%	70–85% (monoterpenes) >95% (sesquiterpenes)
Preservation Method	N/A	Flash-frozen (Live Resin)	Sealed mason jar (vapor equilibrium)
Oxidation Exposure	High (open flame)	Low	Very Low (CO <sub>2</sub> -displaced O <sub>2</sub> )

The Raw Garden Joint (Raspberry Haze) listed 2.2% terpene content on its label. No terpene percentage was listed on the Box Lunch flower or Raw Garden vape packaging. Live resin products like the Ze Chem vape are flash-frozen immediately at harvest, preserving volatile monoterpenes that would otherwise evaporate during the standard curing process. The Instant Pot method achieves comparable terpene preservation to vaporization by trapping volatiles inside the sealed jar.

## SECTION 11: INDIVIDUAL VARIATION FACTORS

Bioavailability is not a fixed number — it varies from person to person based on genetics, physiology, and behavior. Two people consuming the same product in the same way can experience meaningfully different results. The following factors explain why.

Factor	Effect on THC Absorption / Metabolism
CYP2C9 Genetic Polymorphisms	Affects rate of oral THC metabolism; poor metabolizers experience prolonged effects
Body Fat Percentage	THC is lipophilic; higher body fat increases storage and extends release timeline
Inhalation Technique	Experienced users may achieve up to 25% bioavailability (vs. 15% average)
Dietary Fat Co-consumption	Oral absorption increases 2–3x when consumed with fatty foods

Factor	Effect on THC Absorption / Metabolism
Lung Health	Affects inhalation efficiency and gas exchange rate

The dietary fat variable is particularly relevant for oral consumption. THC is highly fat-soluble, and consuming decarboxylated cannabis alongside butter, coconut oil, or another saturated fat can increase intestinal absorption by two to three times compared to eating it on an empty stomach without fat.

# SECTION 12: MASTER REFERENCE TABLE

The following tables consolidate every metric from this guide into a single reference. Each sub-table covers one analytical dimension. Together, they provide the complete picture of all three products across identification, cannabinoid content, pricing, value, bioavailability, and psychoactive equivalence.

## 12.1 — Product Identification

Field	Flower	Vape	Joint
Brand	Box Lunch	Raw Garden	Raw Garden
Type	Fine Cut Flower	All-In-One Vape (Refined Live Resin)	Single Joint (Live Sauce Infused)
Strain	Blue Dream	Ze Chem	Raspberry Haze
Classification	Sativa-Dominant Hybrid	Sativa	Hybrid
Net Weight	14g (0.5 oz)	1g (0.035 oz)	1g (0.035 oz)
Batch/Lot ID	PB-011926-BD-FCC-S	250001396	250001510
UID	1A406030004 6B41000022267	1A406030000 2EE1000090112	1A406030001 818D000074476
MFG/PKG Date	01/19/2026	10/07/2025	11/12/2025
License	N/A	CCAP, LLC DCC-10003156	CCAP, LLC DCC-10003156

## 12.2 — Cannabinoid Profile

Field	Flower	Vape	Joint
THC (label)	28.9%	815.0 mg	280.9 mg (26.5%)
CBD (label)	0.2%	2.1 mg	<2.0 mg
Total Cannabinoids	29.4%	83.5%	N/A
THCa (label)	N/A	N/A	184.4 mg
Terpenes (label)	N/A	N/A	2.2%
Calculated THCa (mg)	4,046	N/A	184.4
Theoretical THC (mg)	3,548	815.0	280.9

Field	Flower	Vape	Joint
THC at 97% decarb (mg)	3,442	N/A	N/A

## 12.3 — Pricing & Tax (19% Excise)

Field	Flower	Vape	Joint
Pre-Tax Price	\$19.50	\$40.00	\$15.00
Excise Tax (19%)	\$3.71	\$7.60	\$2.85
Sales Tax (7.75%)	\$1.80	\$3.69	\$1.38
Out-the-Door Price	\$25.00	\$51.29	\$19.23

## 12.4 — Value (Pre-Bioavailability)

Field	Flower	Vape	Joint
Theoretical THC (mg)	3,548	815.0	280.9
Cost per mg THC	0.70 cents	6.29 cents	6.85 cents
mg THC per \$1	141.9	15.9	14.6
Units to match flower	1	4.35	12.63
Cost to match flower	\$25.00	\$223.11	\$242.87
Cost multiplier	1.0x	8.9x	9.7x

## 12.5 — Bioavailability & Absorption

Field	Flower (Smoked)	Vape	Flower (Oral)
THC Available (mg)	3,548	815.0	3,442
Bioavailability	15%	40%	8%
THC Absorbed (mg)	532.2	326.0	275.4
Cost/Absorbed mg	4.7 cents	15.7 cents	9.1 cents
Absorbed mg per \$1	21.3	6.4	11.0
Onset	1–3 min	1–3 min	60–120 min
Peak	10–15 min	5–10 min	2–3 hrs
Duration	2–4 hrs	2–3 hrs	6–8+ hrs

Field	Flower (Smoked)	Vape	Flower (Oral)
Metabolite	Delta-9-THC	Delta-9-THC	11-OH-THC

## 12.6 — Psychoactive Equivalence (with 11-OH-THC Adjustment)

Field	Flower (Smoked)	Vape	Flower (Oral)
Absorbed THC (mg)	532.2	326.0	275.4
Potency Multiplier	1x	1x	2x (conservative)
Psychoactive Equiv. (mg)	532.2	326.0	550.8
Psychoactive Units/\$1	21.3	6.4	22.0

## 12.7 — Decarboxylation Method Comparison

Dimension	Oven	Instant Pot	Sous Vide
Temperature	220–245°F	~240°F	~203°F
Stability	±15–20°F	±2°F	±0.1°F
Duration	30–45 min	3 hrs	1–4 hrs
Conversion	~97%	95–100%	Variable
CBN Risk	Moderate	Very Low	Negligible
Terpene Retention	Low	High	Highest
Odor	Poor	Excellent	Excellent
Skill Level	Moderate	Low	Low–Moderate

— End of Guide —

Verification: Double-checked (Gemini 3.1 Pro) and triple-checked (Gemini 3 Flash). Compiled by Claude Opus 4.6. All figures verified to sub-cent precision.