

## A Better Route to High Dosage Without Psychoactivity?

# Juicing Raw Cannabis

By Martin A. Lee

William Courtney, a well-known Mendocino County-based physician, recommends eating — or juicing and then drinking — raw cannabis leaf and bud as a way to achieve megadose cannabinoid intake without psychoactive effect. The green plant contains THC in its acid form, THCA, which is not psychoactive.

Leading proponents of ingesting raw cannabis — not just in response to illness but for general health maintenance — include Dr. Courtney's wife Kristen. For many years, an ailing Kristen Courtney had struggled with systemic lupus. Her prognosis was dismal. But in 2008 her condition improved dramatically after several weeks of ingesting raw cannabis and drinking the juice of THCA-dominant plants. Convinced that they had discovered a cure for chronic illness, the Courtneys became passionate advocates of juicing. They have inspired a following of true believers in Northern California and beyond. Juicing, the Courtneys argue, is the best way to consume cannabis therapeutically. But many of their claims about the advantages of juicing are unsubstantiated and misleading.

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### A dietary supplement

Courtney recommends “expanding our use of cannabis from the 10-milligram psychoactive THC dose to the 600-to-1000 milligram dietary dose.”

He explains in an online Q&A: “The main psychoactive compound in dried, aged cannabis is delta-9 THC, which is absent in the raw, fresh leaf. In general, patients do not experience a ‘high’ from consuming the raw product. However, other compounds in the plant, such as the terpenes, may have an effect on mood or energy levels.

“Raw bud has a higher concentration of cannabinoids than leaves and is an excellent method of consumption if you have the resources to make this possible. Both are extremely beneficial but they are best combined... Bud should be at the state where the trichomes are fully present but not yet amber (i.e., cloudy). Leaves for eating or juicing should be picked from plants well into flowering stage.”

For palatability, the Courtneys recommend blending raw cannabis with “a minimal amount of organic fruit or vegetable juice, just enough to cut the bitter taste of the raw cannabis.”

A wheat-grass juicer is recommended for those using large quantities of leaf. A blender is the preferred method for juicing buds — “quicker, easier to clean, and you recover closer to 100% of what you put in,” according to Courtney.

Raw cannabis, unripened, should be stored in the refrigerator or freezer in bags that extend the freshness of vegetables. The Courtneys recommend soaking leaves in water for five minutes before juicing.

THCA is cleared rapidly from the blood. Courtney suggests splitting the juice into portions to be consumed during the day.

### Not for Everybody

Raw cannabis does not provide acute symptom relief, Courtney acknowledges, although “some effects can be immediate.” One patient at the Humboldt Patient Resource Center in Northern California reported immediate relief from severe nausea after drinking juiced cannabis.

Some effects, according to Courtney,

“take three days to be appreciated. Others build for weeks. Full clinical benefit may take four to eight weeks to take effect. It takes that long for plant (phyto) cannabinoids to fully saturate the body's adipose (fat) tissue. Phytocannabinoids are stored in the adipose tissue, as are the fat-soluble vitamins A, D, E & K. Bud may have an effect in a shorter period of time.”

Courtney cautions people with kidney or gall bladder problems that raw cannabis might pose a risk. He would not recommend it for a patient with Hypercalciuria, type II, Enteric Hyperoxaluria, or Primary hyperoxaluria.

Also, Courtney notes, anyone on prescribed medications that can be blocked by grapefruit or pomegranate juice should advise their doctor if they are considering a raw cannabis regimen. Ditto those who are taking blood-thinning drugs such as Coumadin. Most leafy greens contain high amounts of Vitamin K, which can prevent the liver from metabolizing such drugs; raw cannabis might, too.

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Those who wish to pursue a juicing regimen face a major obstacle: how to obtain sufficient amounts of raw cannabis? Purchasing large quantities of cannabis is beyond the budget of most medical users. And growing your own bud — the ideal in terms of freshness — is an option for all too few in our society and throughout the world.

The Courtneys advise: “If you know a local organic grower, ask if you can use their excess leaves. Also, ask about purchasing bud in its raw state. Only use organic cannabis that does not have any pesticides applied at any point in its life cycle. Make sure there are no toxic miticides.”

### Ambiguous information re dosing

Dr. Courtney recommends using 25 large fan leaves per day in juice, salsa, pesto, salad, etc. If you have access to fresh bud, he recommends one bud/day for general health maintenance. “If you are suffering from a serious condition,” he adds, “that can go up to several buds/day.”

To determine the cannabinoid content of fan leaves, a prospective juicer sent 30 large leaves from a flowering Omrita Rx plant to The Werc Shop in Los Angeles for analysis. They were found to contain a combined total of 11.5 milligrams of THCA and CBDA (cannabidiol in its raw acid form). To ingest 600 mgs of cannabinoids, by this measure, one would need to juice more than 1,500 leaves every day and/or a significant amount of bud.

### 70 Trillion Interactions?

Courtney credits Ruth Ross of the University of Aberdeen with the discovery that CBDA and CBGA (cannabigerolic acid) have marked activity at the GPR55 receptor, a protein implicated in tumor formation, cancer-cell proliferation, and pain perception (see story on page 9).

At the 2012 meeting of the International Cannabinoid Research Society, in Freiburg, Germany, Mary Abood of Temple University discussed the extent to which GPR55 is expressed in the body. From these two sources, Courtney deduced that “if you smoke, bake, vaporize, sautee... CBDA, CBGA and quite probably THCA, you decarboxylate all the cannabinoid acids, sacrificing an interaction with 70 trillion cells.”

Decarboxylating, (i.e., heating) the plant converts the cannabinoid acids into their

neutral form: nonpsychoactive THCA becomes psychoactive THC and CBDA becomes CBD. But the notion that ingesting heated cannabis sacrifices “an interaction with 70 trillion cells” is dubious.

“The basic research on GPR55 is still in its infancy,” says Jahan Marcu, PhD, a scientist who has worked in Abood's lab. “Experts in the field have published conflicting reports on the activity of various cannabinoids at this receptor. Dr. Abood and Dr. Ross would most certainly caution against extrapolating these findings into effects on humans.”

A 2012 report co-authored by Ross in the *Journal of Biological Chemistry* noted that several neutral cannabinoids, including CBD, interact with the GPR55 receptor. Of all the compounds tested (acids and neutrals), the neutral variants — THCV, CBDV, CBGV — had the strongest binding affinity for GPR55.

THCA, by contrast, is a weak agonist of GPR55, according to Ross and her colleagues, whereas CBD and CBDA are both GPR55 antagonists.

To apply Courtney's image in reverse, a person ingesting raw cannabis is “sacrificing an interaction” with the CB2 receptor. Unlike THCA, neutral THC activates the CB2 receptor, which regulates immune and peripheral nerve function.

Stimulating the CB2 receptor doesn't have a psychoactive effect because CB2 receptors are localized predominantly outside the brain and central nervous system. THC also binds to CB1, which is concentrated in the brain and the central nervous system (CNS). This is what makes a person feel high.

### CBDA and CBD

There have been numerous studies demonstrating CBD's potential efficacy in treating heart disease, diabetes, cancer, and neurological illness — but very few studies involving CBDA. During a talk at the 2012 Patients Out of Time conference in Tucson, Courtney frequently referred to CBD research as if the findings also applied to CBDA.

CBD and CBDA both have therapeutic attributes, but they are not the same. And it is by no means evident that CBDA is innately superior to CBD, as Courtney implies. Or that THC is “psychotoxic,” as he has characterized it.

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Pioneering research conducted by Dr. Sean McAllister at the California Pacific Medical Center in San Francisco, has established that CBD (and THC) are potent inhibitors of breast cancer cell proliferation, metastasis, and tumor formation. But he found that “Compared to CBD, CBDA had negligible effects in cell viability assay against multiple cancers. We therefore never took a great interest in the molecule.”

McAllister noted the findings of a 2006 report, “Antitumor Activity of Plant Cannabinoids with Emphasis on the Effect of Cannabidiol on Human Breast Carcinoma,” by Alessia Ligresti and a team of Italian scientists: “For in vitro studies, the cannabinoids under investigation were screened for their ability to reduce cell proliferation on a collection of tumoral cell lines. Cannabidiol always exhibited the highest potency... Cannabidiol acid was the least potent compound. Among the other plant cannabinoids, cannabigerol was almost always the second most potent com-



WILLIAM L. COURTNEY, MD

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pound, followed by cannabichromene.”

Kristen Courtney treated herself by juicing THCA-dominant cannabis at a time when there were no analytical labs serving the medical marijuana community in California. In recent years, as CBD-rich plants have been identified and found to be medically beneficial, the Courtneys began to advocate juicing for CBDA content.

Cannabidiol is nonpsychoactive in its acid as well as neutral form; thus “psychotoxicity” is not a factor at any dose of CBD. So why should one go through the trouble of procuring and juicing large quantities of CBDA-rich verdure when measured doses of CBD-rich concentrates are available for patients?

Courtney has suggested that neutral cannabinoids are inferior because they are “synthetic,” by which he means not produced by the living plant. But as the plant dries, decarboxylation occurs naturally. In some tropical cannabis strains, significant decarboxylation happens before the plant is harvested.

### A Patient's Lament

A middle-aged man with prostate cancer, a patient of Dr. Courtney's, contacted Project CBD, seeking information about where to obtain large quantities of CBD-rich marijuana in order to juice it. He didn't want to smoke it or vaporize it, he explained, because “Dr. Courtney says it doesn't work if it's heated.”

Perhaps this desperate patient misunderstood Dr. Courtney. Or perhaps he was misled by Courtney's contention that ingesting cannabinoid acids is the best way to utilize the plant for therapeutic purposes.

There's not a lot of science about cannabinoid acids in general and CBD acid in particular. From what we know, these compounds have medicinal value and juicing cannabis may help people with certain conditions. But how these benefits are conferred is not entirely clear.

One certain advantage of ingesting fresh raw cannabis is that you're getting most if not all of the volatile terpenes, and plenty of chlorophyll. Juicing organic fruits and vegetables, especially leafy greens, is a health-positive practice, even when cannabis is not part of the mix.

An interesting experiment would be to compare the therapeutic outcomes of those who juice CBDA-rich cannabis with another group of people who juice wheat grass or leafy greens while taking measured doses of decarboxylated CBD-rich extracts.

There are many valid ways to administer medicinal cannabis. One size doesn't fit all with respect to cannabinoid therapeutics.