



## Cannabidiol (CBD) supplements: Are we there yet?

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### HEMP vs MARIJUANA

HEMP AND MARIJUANA BOTH DERIVE FROM THE CANNABIS SATIVA FAMILY. THEY DO SHARE CERTAIN SIMILARITIES. HOWEVER, DUE TO EACH PLANT'S BIOLOGICAL STRUCTURE, THEY HAVE SEVERAL VERY DISTINCT AND CRUCIAL DIFFERENCES.

 <p><b>HEMP</b></p> <p><b>Product</b></p> <ul style="list-style-type: none"> <li>• CBD oil</li> <li>• Hemp oil</li> <li>• Cannabis oil (made from hemp)</li> </ul> <p><b>Contains</b></p> <ul style="list-style-type: none"> <li>• 0.3 % or less of tetrahydrocannabinol (THC)</li> </ul> <p><b>Characteristic</b></p> <ul style="list-style-type: none"> <li>• Hemp and industry hemp refer to the strain of cannabis plant that is grown for agricultural products such as textiles, seeds and oils.</li> <li>• Can grow in most climates, bunched together with other plants, requires little care.</li> <li>• Can grow as high as 20 feet with leaves bunched near the top of stem.</li> <li>• No psychoactive properties</li> </ul>	 <p><b>MARIJUANA</b></p> <p><b>Product</b></p> <ul style="list-style-type: none"> <li>• THC oil</li> <li>• Marijuana oil</li> <li>• Cannabis oil (made from marijuana)</li> </ul> <p><b>Contains</b></p> <ul style="list-style-type: none"> <li>• 15 - 20 % of tetrahydrocannabinol (THC)</li> </ul> <p><b>Characteristic</b></p> <ul style="list-style-type: none"> <li>• Marijuana is known for its flowering tops of the plant. The flowers are typically bared to have a high THC.</li> <li>• Growth is carefully monitored, controlled in an isolated, warm, humid area to maximize psychoactive uses. Cross-pollination can ruin THC content.</li> <li>• Shorter, resembles a bush, with more leaves and buds surrounding the plant's body</li> <li>• Psychoactive side effects.</li> </ul>
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Hemp and marijuana are plants that belong to the *Cannabaceae* family. These plants contain more than 80 biologically active compounds in various different concentrations. The most commonly sought-after compounds in cannabis are delta 9-tetrahydrocannabinol (THC; the psychoactive component that triggers the 'high') and cannabidiol (CBD). Industrial hemp is derived from strains of *Cannabis sativa* using specific growing conditions and cultivation practices that reduce the level of THC to the minimum (less than 0.3%). For centuries, hemp was cultivated, and its products were used in hemp oils, wax, resin, clothes, ropes, sails, hemp seed food and much more.

Since passing of the 2018 Farm Bill that removed hemp-cannabis or its derivatives with a very low THC content from the Federal Controlled Substances Act, the interest in hemp and CBD products among consumers, growers and manufacturers has skyrocketed. (Google Trends)

Currently, CBD products derived from hemp are legal in all 50 states and consumers can purchase low-THC industrial hemp CBD without a prescription. CBD products are widely available as dietary supplements, edibles, vapes, drinks, tinctures (drops; one of the most common forms of CBD in the market), inhalers, nasal sprays, cosmetics and body care products, workout drinks, herbal teas, CBD patches, suppositories, capsules and soft gels, and pet products. One will be surprised how CBD is being used in food products ranging from popcorn and cheese puffs to honey. Similar to its use for human consumption, smaller doses of CBD in pet capsules and topicals are available for pets to ease inflammation and soreness. Supermarkets and grocery stores such as Kroger sell CBD containing products at 945 stores in 17 states, including Kentucky. The increased availability and claims of CBD and the limited scientific evidence to make detailed regulations from the United States Food and Drug Administration (FDA) is confusing and misleading consumers on the benefits and side effects of application of CBD as a drug or as a recreational substance. Several marketers advertise CBD containing products as superfoods with no side effects. Being legal to purchase and consume, many consumers think it is safe as it does not give us the 'high'. Several studies on CBD have found it to have health promoting properties. Publications and claims report it to have antibacterial, neuro-protective properties, and inhibit cancer cell growth, promote bone growth, suppress muscle spasms, reduce seizures and convulsions, control blood sugar, inflammation, small intestine contractions, vomiting and nausea. It is recommended for pain relief and is studied to

combat the opioid crisis in patient with anxiety, trauma and pain, bipolar disorder, schizophrenia, and multiple sclerosis (Clinical Studies and Case Reports, 2019, Osborne 2017). However, more clinical studies are needed to conclude the role of CBD alone in alleviating cognitive and psychotic conditions in pathological conditions (Osborne 2017).

## Where does CBD oil Stand?

Hemp oil and CBD (comprising 40% of cannabinoids in hemp extracts) are non-psychoactive and are known to provide relief from anxiety and inflammation. Its antibacterial and antioxidant properties remain to be fully explored. While it is safe and legal to use hemp oil and some CBD products in reasonable dosage, consult your health care provider to determine the correct product and access any real risks that need to be considered before taking CBD. According to an official announcement by FDA in April 2019, only one drug, Epidiolex, has been approved by FDA to treat two rare and severe forms of epilepsy. It is currently illegal to market CBD by adding it to food or labeling it as a dietary supplement (Office, 2019).

Though CBD shows promising results in alleviating symptoms of mental disorders, more clinically conclusive research is still in its infancy.

## How they work in our body?

Cannabinoids activate cannabinoid receptors in the brain, which transmit signals and cause varying physiological effects in the human body. These cannabinoid receptors (CB1) primarily found in the brain are also found in intestines, connective tissues, gonads and other glands in the body. Other type of cannabinoid receptors – CB2, are found in the human immune system. The binding of CBD with CB1 and CB2 receptors in turn activate receptors that control body function such as homeostasis, pain perception, body temperature and inflammation. It also increases levels of anandamide (commonly known as the ‘bliss molecule’), which is responsible for the neural generation of motivation and pleasure. The stimulation of endocannabinoid system by CBD reduces pain perception and inflammation. (Pertwee, 2008, Ibeas Bih et al., 2015)

# CBD CONSUMPTION METHOD

CBD IS A TYPE OF CANNABINOID FOUND IN HEMP AND MARIJUANA. IT IS NON-PSYCHOACTIVE, MEANING IT DOES NOT PRODUCE THE “HIGH” THAT THC, ANOTHER CANNABINOID FOUND IN MARIJUANA, DOES WHEN TAKEN MEDICINALLY OR RECREATIONALLY. CBD IS CURRENTLY BEING USED WIDELY AS AN EFFECTIVE TREATMENT FOR CHRONIC PAIN FOR PATIENTS WITH CONDITIONS SUCH AS JOINT PAIN, WITHDRAWAL SYMPTOMS, OR CANCER.



### CBD CAPSULES

CBD capsules are oil put into pill form. Most people turn to a CBD capsules because of the convenience. The amount of CBD is specified, so it's easy to monitor how much you are taking? Many take CBD capsules as a daily supplement or in place of pain relievers.



### CBD OIL

CBD oil is the standard and most common form of cannabidiol. It is simple, pure CBD oil. An oil tincture needs a base for CBD, which can be any number of natural oils. CBD oil in tincture form is often added into other products



### CBD BALM

CBD products - from topical lotions to sublingual CBD oil drop - can help keep your skin looking and feeling wonderful. They could even be an effective part of a therapy plan for severe skin issues. Be sure to discuss utilizing CBD as a part of your skin care routine.



### CBD VAPES

CBD oil is the concentrated form of cannabidiol in a liquid form, which is heated and inhaled through an e-cigarette, vape pen or vaporizer. CBD vape oil can be purchased in a bottle to refill your vaporizer or as a one-time use cartridge for your vape pen.

## Safety, side effects and quality

Though legal and commonly advertised as safe, CBD has the potential to harm and can cause side effects.

CBD can cause liver injury and drug interactions which may increase or decrease the effect of other medications. CBD induced liver injury can go unnoticed if not monitored by a healthcare provider. In addition, CBD can cause the changes in alertness, somnolence including insomnia, gastrointestinal problems, diarrhea, decreased appetite, upset stomach, frequent mood changes, irritability and agitation. FDA's working group for CBD and CBD products is actively studying the safety of these products and identifying the risks involved in consumption of total CBD exposure (recommended daily dosage, percentage absorbed by skin from CBD topicals), effect of CBD in special populations such as pregnant and lactating women, children and the elderly as well as in pets.

FDA and the Federal Trade Commission does not regulate several CBD containing products including dietary supplements before they are marketed on shelves today for human or animal use. Thus, it is not uncommon for labels of botanical dietary supplements to differ from their actual contents and effects. Some companies were sent warning letters in April 2019 in response to their unfounded medical and health claims on their product's use against cancer, autoimmune disorders, opioid use disorder, and other diseases. Their claims were without sufficient science based evidence (For more information, [click here](#)). In addition, there is lack of evidence that the percentage content of CBD in the available products is consistent with the claimed percentage on the label. A study conducted by University of Arkansas and the National Center for Natural Products Research screened 25 CBD products available commercially for their CBD and THC content using mass spectrophotometric methods. Of the 15 CBD products only 1 product contained CBD as labeled (100% of percentage claimed). One CBD product exceeded the percentage of CBD claimed on the label by 2280%. Currently known side effects and unknown effects of CBD in our body raise the risk to the consumer using products with inadequate information (Gurley, FDA media 2019)

## Take away

- Check with your physician before starting any CBD products. Every individual has unique tolerance level of these cannabinoids. Work with your healthcare provider and monitor self-dosing to find your optimal levels.
- Check with the veterinarian before administering CBD products to animals.
- Less toxicity does not mean lack of toxicity. Dietary supplements or addition of CBD to food is still restricted by FDA due to lack of evidence to support safe use and their side effects.
- Remember, hemp is not same as marijuana; CBD derivatives from marijuana and CBD derivatives from hemp is not the same. CBD derived from hemp has been removed from the list of controlled substance in the 2018 farm bill; however, CBD and THC derived from marijuana is still classified under Schedule I of the Controlled Substance Act.
- Some CBD products including cosmetics, foods and products marketed as supplements are available widely, labelled with unproven medical and health claims and very little information disclosed about their manufacturing practices.
- CBD as a chemical may have several health promoting properties. However, evidence of these properties to benefit humans and animals is limited, especially regarding knowledge about their dosage and absorption in our bodies. For more information on important aspects of using CBD that are still unknown [click here](#).
- If the claims on the label sound too good to be true, at least for the present, it is not true. Check the FDA website for updates, if you are thinking about their use or have been recommended using CBD containing products.
- Dietary supplements and cosmetics products are not regulated by FDA under DHSEA before reaching the market unlike CBD containing drugs. It is important to note, currently only one CBD containing drug has been approved by FDA.
- There are certain benefits to their use, but do not start using them without consulting a healthcare provider.

*Disclosure: Kentucky State University does not endorse or condemn any products and manufacturers mentioned in this factsheet. Their use in this factsheet is merely to communicate current and accurate information available to the community.*

## Reference links:

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- Bill Gurley, University of Arkansas for Medical Sciences, College of Pharmacy Content vs. Label Claim: A Survey of CBD Content in Commercially Available Products  
Accessed via a public hearing published on May 31, 2019 on [fda.gov](https://www.fda.gov)

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<sup>1</sup>This image does not promote use of CBD products or vaping in any form. It is a mere representation of available forms of products and general guidelines for its use. We strongly recommend that the consumer must consult a healthcare provider and follow instructions given by a healthcare provider and/ or on the product label.