



“CBD? What’s the Deal with Hemp?”

Webinar Episode #1

Question and Answer

This document is not intended to replace or provide medical and/or legal advice. The intent is for educational purposes and is answered to the best of our knowledge, based off of first-hand experience, education, and research.

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How does the USDA define hemp?

- “The term ‘hemp’ means the plant *Cannabis sativa* L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a delta9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis.”

What forms (liquid, powder, etc.) of CBD are available currently, in today's market?

- There are many forms of cannabinoids being manufactured from hemp. Full spectrum and broad-spectrum concentrates, which include CBD, are usually hydrophobic oils and powders, depending upon extraction and refinement methodology. Isolate is a powder consistency. We have also seen the cannabis industry adopt spray drying, encapsulation, and nano-emulsification technologies, which produce powder ingredients. There are also pre-infused oils, such as Nextraction’s CBDA infused grapeseed or hemp seed oils. These are a simpler way for brands to integrate cannabinoids into existing and new formulations.

Are the companies that deal in CBD products using both in-house AND external (non-biased) QC in assuring their products’ (ingredients) safety and efficacy?

- Some cannabinoid manufacturers utilize both in-house and third-party QC. It is our belief that third-party Certificate of Analysis (COAs), showing a full array* of tests verified through a qualified lab --ideally a lab with a history of cannabis testing-- is the gold standard and truly the only testing that matters. And, remember that concentrate ingredients and the final product should both be tested.
- Full COA’s include: potency, shelf life (water activity or moisture level) microbial, mycotoxin, pesticide, heavy metal, solvent (as applicable), and terpenes (as applicable)

What "assistance" (if any) from CBD providers (suppliers) is available to companies that wish to incorporate CBD in their product lines?

- There is no industry standard. At NeXtraction, our model is to help clients at every stage of the product development process in which they may wish to involve us. We work with clients on everything from product design/ indication, to formulation development and dosing guidance, to testing, and to the introduction of appropriate fillers that work well

with cannabinoids. Our client support also importantly includes a commitment to providing ongoing education.

How do each of the states manage the legality of CBD in bar soaps?

- Non-THC cannabinoids, including CBD, are allowable under the 2018 Agricultural Improvement Act. This means that, if a hemp extract falls below this legal threshold of 0.3% D9THC, it is legal for interstate commerce.

Is there an upper limit of CBD required by law in personal care products that doesn't require regulatory approval?

- To the best of our knowledge, there is no regulatory standard or “upper” limit. We recommend working with a manufacturer and / or formulator that understand dosing and indications for each particular cannabinoid. Besides working with NeXtraction, look for guidance through available research and /or anecdotal evidence.

What are the liability risks of having CBD in Personal Care products without efficacy and test data?

- A vast body of research knowledge about hemp-derived cannabinoids is already greatly accumulated and mounting daily, which, in toto, would seem so far to indicate that liability risks are greater than actual risk of harmful effect. That said, efficacy studies are being started across vast areas/disciplines at an ever-accelerating rate. Besides assessing your own liability risks and seeking your own legal advice (not given here), to reduce the risk of public health impacts, we implore you to obtain a full, third-party certificate of analysis which includes potency, heavy metals, pesticides, microbial and mycotoxin measures to help ensure ingredient safety and quality.

Want to understand legal ramifications for filling products that contain CBD (legality) as well as FDA regulations:

- The FDA has not provided prescriptive rules when it comes to filling products that contain cannabinoids. The FDA does allow for the use of cannabinoids in cosmetic topicals. We also know, that if a cannabinoid concentrate meets the USDA definition of hemp (0.3% D9THC or less) the ingredient falls under the regulatory guidelines set forth in the 2018 Agricultural Improvement Act.

Current European regulations allow CBD NOT extracted from the hemp flower. Does such a CBD exist on the market?

- There is CBD that can be formed from micro-organisms and there is a small study that suggests orange peels might also contain trace amounts of cannabinoid.
- It is our understanding of recent European rulings that the D9THC threshold for cannabinoid concentrate products has been increased from 0.2% to 0.3%. We also understand there to be possible extraction limitation when it comes to actual methodologies and solvents allowed. According to private brokerage sources, and in our experience the following European countries allow CBD imports:



- Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Scotland, and Sweden.
- There is a mixture of laws governing cannabinoids, but, in general, the requirements appear to be euGMP and /or the novel food application route.
- Customs can be the biggest barrier when importing cannabinoids. The hemp industry has several brokers working toward educating Customs directly in different countries. We recommend using a broker with a proven track record of exporting and importing cannabinoids.
- Non-THC / 0.3% or less cannabinoid concentrates are also legal in the following countries: USA, Australia, Argentina, Belize, Brazil, Canada, Chili, Columbia, Costa Rica, Ecuador, Guatemala, India, Peru, South Africa, and Thailand (This may not be an exhaustive list).

We are a global company based in USA. We wish to market our products world-wide. How is CBD viewed from a legal perspective outside the USA, say for EMEA and LATAM?

- Most standards and regulations indicate that shipping USA manufactured cannabinoids into other countries is legal. There are several brokers that work within this space. Recent WHO rulings have announced the rescheduling of cannabis (in general) and we anticipate this to also open new doors.

I have been looking for a company to partner with for a CBD business. I have tried samples from about 8 companies. Their terminology is all over the map with no standard information like Nicole explained. My question is how can I be confident I am partnering with a true Seed to Product company. Some say they are but when I begin to do a due diligence, they usually admit they are purchasing their CBD crude from another company.

- Good that you are doing your due diligence. Earned, verified, demonstrated trust makes for a good business partnership. The legacy hemp industry has been set up with little standardization, oversight or formal requirements. The best way to ensure you are receiving a safe, quality product is by working with a company that can show full transparency for seed to sale. Any cannabinoid manufacturer should, at minimum, be able to supply:
 - Hemp
 - Farm name and growing techniques
 - Allergen statement
 - Pesticide statement or test
 - Full Hemp Testing COA, from a third party
 - Concentrate
 - Concentrate inputs
 - Full Concentrate COA, from a third party
 - General
 - GMP certification
 - FDA Registration



- The above two qualifications are not formal requirements. However, they are reasonable prerequisites and completely within the scope of a cannabinoid manufacturer to hold. Both ensure a manufacturer is following basic safety and quality assurances.

Is there a place that would list individual state laws concerning CBD products (specifically fragrance diffusers)? Are there states in which CBD products are illegal? I have found a lot of conflicting information on the internet.

- Under the 2018 Agricultural Improvement Act cannabinoid extracts (“hemp”) that contain 0.3% D9THC (and 0.3% Total THC) or less are legal for interstate commerce. The act requires each state to set forth a law for hemp enforcement. Many states have submitted these laws and were approved in 2019/2020. Generally, these laws are enforced by each State’s Department of Agriculture. The National Conference of State Legislators has a page dedicated to linking to each state program. You can find that list here: <https://www.ncsl.org/research/agriculture-and-rural-development/state-industrial-hemp-statutes.aspx>
- There were at first some highly publicized examples of states that did not respect the legal transfer of hemp and CBD, however, the injunctions these states issued against such transfer were deemed to have been illegal (...page 426 of the 2018 Agricultural Improvement Act clarifies this). We are unaware of any specific product legality list that exists nationally or by state. California invokes a Prop 65 warning on products containing D9THC. You can see that information here: <https://oehha.ca.gov/proposition-65/cnr/chemicals-listed-effective-january-3-2020-known-state-california-cause>

What about the capitalistic and racial implications involved in the past suppression of cannabis?

- Cannabis has a controversial and socially charged history. It is on our agenda to share some of this history in one of our forthcoming webinars. ...It is worth mentioning here, as well, that we perceive the MORE Bill, which has passed in the US House (12/6/2020), as lacking needed consideration on these topics. We are hopeful of a more comprehensive and socially responsible legislation package being brought forth.

What is the name of the new standardized assay?

- CannaQAP Is the name of the program. Below is the link for more details including a contact for those labs that want to participate:
 - <https://www.nist.gov/news-events/news/2020/07/nist-help-labs-achieve-accurate-thc-cbd-measurements>

Is the 0.3% max allowance legal in all states for formulating products?

- Yes, the 2018 Agricultural Improvement Act allows for interstate commerce of cannabinoid (hemp) containing extracts that fall below the 0.3% D9THC threshold.



Can we sell this product in France? In France we can't have Cannabidiol from another part of the plant than seeds and fibers. Only seeds and fibers are authorized.

- Yes. It's our understanding extracts from industrial hemp that fall below the 0.3% D9THC threshold are legal for sale in France. We recommend checking with your local hemp advocacy group to understand more about the legality and customs process.

Are either CBD oil or Hemp oil TSCA listed?

- We are unaware of either of these compounds being listed on the TSCA list. D9THC is a Prop 65 listed compound. See link immediately below.

Are there any absorption benefits to Hemp powder mixed/ dissolved in liquid and consumed as a beverage?

- We are unaware of any peer-reviewed research that addresses this question. There are anecdotal reports that a small number of cannabinoids within beverages may be bio-available. The WHO has synthesized research on CBD bioavailability on page 11 found here: https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf

What data exist that CBN helps improve sleep quality, and do we know the pathways by which that condition is achieved? Alyson mentioned that anti-inflammatory effects might be involved. Any data to back this up?

- Cannabinol, CBN, has been shown anecdotally to improve sleep quality as reported by many consumers. Research and clinical trials are being performed in this area around the world. Below are two papers discussing general CBN research and another investigating the pain related mechanisms.
 - <https://www.sciencedirect.com/science/article/abs/pii/S1087079220300824>
 - <https://pubmed.ncbi.nlm.nih.gov/31158702/>
- It's still to be determined if the "improved sleep" or enhanced REM durations are tied to several cannabinoids working together and if these effects can be achieved with isolated compounds. For instance, synthetic CBDA is being investigated for its role in increased REM duration through a complex mechanism yet to be fully understood. What we do know, is that we are just beginning to understand the Endocannabinoid System (ECS) and its impacts on our daily lives.

What types of materials promote endogenous CBD production?

- First, a little bit on the endocannabinoid system:
 - Current research suggests humans produce two endocannabinoids (at least), aka "endogenous" cannabinoids. They are N-arachidonylethanolamine (AEA) and 2-arachidonoylglycerol (2-AG)
 - We conclude AEA and 2-AG are endocannabinoid receptor agonists. They also likely bind and activate the vanilloid receptor (TRPV1). AEA is also shown to be agonist for subtypes of the peroxisome proliferator-activated receptor (PPAR) family.



- We aren't aware of materials that promote the production of AEA and 2-AG. We reason exercise may induce the production of these chemicals and is one and the same theory behind the "runners high!" Here is a research article describing this mechanism: <https://www.nature.com/articles/npp2017130>
- It is worth noting that the endocannabinoid system, to date the body oldest and largest signaling system (formally recognized as such in 1992), is only beginning to be understood and widely explored, especially within the US. Notably, Israel has many great examples of research programs for cannabis derived cannabinoids.

Please expand on CBDA-specific effects vs. those of full spectrum CBD, thanks!

- CBDA has been looked at as a COX-2 inhibitor ("anti-inflammatory"), TRPV1 agonist, and is likely involved with cell apoptosis in certain breast cancer variants. We invite you to read the post peer-reviewed research we frequently review and post on our website regarding CBDA and the other acidic cannabinoids. As you will find, there would seem to be many overlapping similarities between indications for CBD and CBDA, including seizure reduction.
- Find the latest in acidic cannabinoid research here: <https://nextraction.com/education>

So, is THC legal to use in topical formulated products?

- Delta 9 THC is legal under the 0.3% threshold (as part of a hemp derived extract) and can be used under the 2018 Agricultural Improvement Act.

When we see aroma oils for diffuser use that have CBD Oils or Hemp Seed Oils, is there a scientifically proven benefit for those users emitted by the fragrance?

- We are not aware of any peer reviewed research that supports this use. However, there is anecdotal evidence that may support it.

Isn't it quite strange that FDA consider caffeine as a drug, yet tea or coffee extract (both of which contain some amount of caffeine) are not considered as drugs?

- Many industry advocates and leaders believe this is the way cannabinoids will be regulated in the future. It is likely hemp-based concentrates will be used in consumer goods and possibly even in OTC applications via the NDI route. Synthetically derived cannabinoids will likely be used within the pharmaceutical industry, though many experts believe this to be decades away. More to come!

Are some common terpenes in CBD/hemp listed as prop 65 chemicals?

- Delta9 THC is in fact listed as Prop 65 compound. We are unaware of any other general class of hemp or cannabinoids on this list. <https://oehha.ca.gov/proposition-65/cnr/chemicals-listed-effective-january-3-2020-known-state-california-cause>



In sustainable packaging options, shouldn't you look at the cost of recycling? Aluminum is recyclable but after collecting, it needs to be cleaned, washed, dried, smelted down and then recast into aluminum foil. All these steps require water and energy. Therefore, one needs to understand costs and benefits of recycling

- Yes, there are a lot of studies on the cost of one recycling process vs. another recycling process vs. the cost of virgin material. This could be cost in dollars or cost to the environment. The simple version of the formula looks at the energy required to recycle the material into a new product. A better answer is a total life cycle analysis that looks at everything including energy, land use, water use, environmental toxicity, human toxicity, etc. The best analysis was done by David Allaway and the state of Oregon. It is complicated. Some points to consider:
 - Highly recyclable materials like metals and glass require a lot of energy to recycle, but usually less energy than virgin material.
 - Being highly recyclable does not guarantee that the item will be recycled. The market value of the material and the ease of sorting are better indicators.
 - The value of recycled glass is almost zero because of the energy required to process it and the problems associated with contamination. Also, glass does not damage the environment the way plastics do.
 - The market value of recycled plastics is determined by demand and by the price of oil.
 - A very thorough lifecycle analysis for a highly recyclable material may assume that the material will be recycled more than once.
 - The Oregon study, “Recyclable: How well does it predict the life cycle environmental impacts of packaging and food serve ware?,” tries to compare a highly recyclable package that requires lots of energy to a non-recyclable package that is low energy. This is the tuna can vs. tuna pouch analysis.
 - The steel can is easy to sort with a magnet and there is a strong market for recycled steel. The 50% of cans that do get recycled will consume energy in the process but it is less energy than virgin steel from ore. The 50% of cans that go to a landfill will return to the earth slowly and harmlessly as iron oxide.
 - The pouch is made out of a PET/aluminum laminate with a PP neck. It requires very little energy to make and it will go to a landfill at the end of life. PET and PP is toxic to wildlife if it ends up in the ocean.

What are the technical properties that cosmetic companies want to improve by using CBD-based ingredients?

- Technical properties may include: Improved moisturization, Improved skin barrier, Soothing/anti-inflammatory, Antipruritic, Acne/oil control, Treating psoriasis/atopic dermatitis
- Dermatology Review, 2018
 - <https://escholarship.org/content/qt7pn8c0sb/qt7pn8c0sb.pdf>
- Aromatic Plant and Cosmetic Symposium- Proceeding Book
 - https://www.researchgate.net/profile/Goeksen_Durbilmez/publication/338342238_Synthesis_of_Hybrid_Nanoflowers_with_Plant_Extracts_Traditionally_Utilized



[In Skin Problems and Their Activity Profile/links/5e0dfc33299bf10bc38c0672/Synthesis-of-Hybrid-Nanoflowers-with-Plant-Extracts-Traditionally-Utilized-In-Skin-Problems-and-Their-Activity-Profile.pdf#page=39](#)

When formulating with cannabinoids, are their extracts that are hydrophilic options? What are the recommendations when looking to formulate in water-based products?

- We are unaware of any 100% hydrophilic option today. We do understand that there are some “water-dispersible” products that are of course slightly “hydrophilic.” There are several technologies being used within the hemp space to try and achieve these water-soluble ingredients. We recommend working with a manufacture that can provide you a sample of their concentrate within one of these forms. Look for beverage additives as an easy example of this.

Which CBD format is best for gummies and why? CBD liquid, nano emulsion liquid, nano emulsion powder?

- The jury is still out on this. We believe efficacious products come in all shapes and sizes. The truth is in the actual relief consumers get. Always ask the manufacturer for a product sample (within use in a formulation) that allows you to feel and / or taste the concentrate and experience the outcomes it may provide.

US verses EU grown Hemp and related genetics--pros and cons of each?

- Both Unions love hemp! Plant genetics, however, should be considered up front, at beginning of manufacture, as each variant has its own unique phytochemical profile (i.e., cannabinoids, terpenes, and flavonoids). For NeXtraction, being a U.S. manufacturing company, cognizant of our carbon footprint, we currently utilize U.S. grown hemp.

May I ask for that Bill number again?

- HR 8179 “Hemp and Hemp Derived CBD Consumer Protection and Market Stabilization Act of 2020,” Sponsored by Reps Morgan Griffith (R, VA) and Kurt Schrader (D, OR)

Are you aware of any large efficacy studies? What disease states (use case) are being used for the study?

- We know that Epidiolex, approved by the USFDA for a specific type of seizure and other particular neurological indications, has been approved with efficacy. There are also a significant number of double-blind studies for different implications within various stages of FDA approval. We are aware of one industry-driven study within the US that focuses on daily use, not necessarily for a particular indication, but rather from a “chronic-use” safety lens.
- Page 18 of the WHO’s CBD review provides a list of indications:
https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf



Is there a gold standard study for toxicity and dosage recommendations? The WHO study seems to be quoted regularly.

- As of right now we are unaware of any one study that is currently being used as a gold standard for dosing. Dosing is indication dependent.
- The WHO has referenced several studies they have reviewed for CBD toxicity, where they have it a having very low potential. You can find the full WHO opinion on page 13 here: https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf

Why are retailers staying away from ingestible today? are capsules (not gel caps) a less desirable delivery format from a consumer perspective?

- The FDA has not given final guidance on ingestible applications (food and beverage) for CBD, in particular as it is approved within the drug Epidiolex. It is important to note that other cannabinoids may not have this barrier.
- We've heard rumors that gel cap manufactures are booking 10 months out for gel caps so there would certainly seem to be interest being shown through consumer market data.

Help me understand GRAS approved CBD--some is GRAS some is not?? Is this distinction by strain? How can some suppliers' CBD be GRAS while others are not?

- Cannabidiol / CBD is not listed as a Generally Recognized as Safe compound (GRAS) in the technical term. Some processes can use GRAS inputs such as, for example, NeXtraction's water extraction technology process.
- The WHO has recognized CBD as "generally safe" and reviewed extensive toxicity damage. You can find the full WHO opinion here, on page 13: https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf

What is the INCI name?

- The INCI for the CBDa will be provided by NeXtraction's based on the blend being used.

Please address how often, and how high, heat can be applied to any of the CBD materials, and the ideal pH range for formulation, to avoid degradation. Thanks!

- The answer is dependent on the extraction method and concentrate material. The biggest considerations are the long, high heat exposures that cause decarboxylation and degradation. We have compiled internal and third-party-reviewed stability data for understanding and monitoring potency degradation.

There are topicals available with different quantities of CBD. Does more CBD work better, or a better blend of terpenes and other oils reacting with receptors?

- We have found dosing within topicals to fall within categories. Antidotally, a 5 mg/ cc CBDA topical + terpene blend for general inflammation relief (1-2 hours.) Not surprisingly, it is important to note that dosing appears to be somewhat dependent upon the user profile. We have recorded anecdotal evidence supporting a 20-40 mg oral dose



of CBDa (in oil sublingual application and chocolate “edible”) to be efficacious toward chronic pain associated with athirst.

- Peer reviewed research its currently being conducted to further understand dosing both topically and for ingestion. We do believe there are bio-availability limits when it comes to ingestible applications, as we understand most neutral cannabinoids undergo metabolism within the liver (Cytochrome 450).

Can CBD transform to THC in the body when taken orally?

- Research indicates this to be unlikely. The WHO did recognize two studies that suggested this conversation may take place at a very low rate (less than 3%). However, these studies have been challenged and real-life evidence of such a conversion within humans has yet to be witnessed even at high doses of CBD (e.g., 200 mg).
- Page 10 of the following WHO document discusses this specifically:
https://www.who.int/medicines/access/controlled-substances/5.2_CBD.pdf

Is it safe to say that as long as claims are not being made of a personal care product, either left on or washed off, it can go to market as long as it contains less than 0.3% THC?

- The 2018 Agricultural Improvement Act allows for hemp extract products that contain less than 0.3% THC/ 0.3% Total THC to be legal for interstate commerce.

Quick References and Resources:

2018 Agricultural Improvement Act, <https://www.congress.gov/115/plaws/publ334/PLAW-115publ334.pdf>

California Prop 65, D9THC, <https://oehha.ca.gov/proposition-65/crn/chemicals-listed-effective-january-3-2020-known-state-california-cause>

State Industrial Hemp Statutes, <https://www.ncsl.org/research/agriculture-and-rural-development/state-industrial-hemp-statutes.aspx>

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