HEMP CBD PRODUCTS

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CBD PRODUCED FROM HEMP is found in products such as body lotions, tinctures, and capsules, just to name a few. The market for these products is growing rapidly—the CBD industry is expected to grow to $22 billion by 2022, up from $327 million in 2017.[1] This rapid growth comes with the need for increased scrutiny of these products to ensure that companies selling CBD products are using hemp extract and carrier oils that have been grown and processed in ways that are healthy for consumers and the environment. It is imperative that companies are transparent about their production practices in the labeling and advertising of their products.

Hemp CBD products are minimally regulated by the United States Food and Drug Administration (FDA).[2] Without stronger regulatory oversight, there may be issues surrounding production and processing methods of these products, and if company claims about its products are actually true. Since federal requirements for these products are weak, industry self-regulation, supported by independent certifications and NGOs, is necessary in this growing field as federal and state regulations take time to develop.

CBD BENEFITS

The increased interest in CBD products can be traced to its potential benefits which include reducing joint pain, decreasing anxiety, and improving sleep.[3] According to the National Academies of Sciences, Engineering and Medicine, there is substantial evidence that cannabis or CBD products can help treat chronic pain, chemotherapy induced nausea and vomiting, and assist in the treatment of multiple sclerosis spasticity.[4] The report also found moderate evidence that cannabis and CBD are effective for improving short-term sleep outcomes in individuals with sleep disturbance associated with obstructive sleep apnea syndrome, fibromyalgia, chronic pain, and multiple sclerosis. Several therapy trials have also found that certain doses of CBD can be used to help treat specific forms of epilepsy.[5] Notably, the World Health Organization states that "no public health problems (such as driving under the influence of drugs cases or comorbidities) have been associated with the use of pure CBD," which should help assuage public safety concerns.[6] All of these findings are encouraging signs of the benefits of hemp CBD products. Ultimately, more independent studies should be conducted to evaluate the benefits of CBD and how best CBD can be utilized to improve the lives of people and pets.

HEMP vs MARIJUANA

The difference between hemp and marijuana can be confusing. Hemp and marijuana are both cannabis plants, but have a different chemical composition. Marijuana is classified as cannabis plants that contain more than 0.3% of the psychoactive chemical compound tetrahydrocannabinol (THC); hemp plants and hemp-derived cannabinol (CBD) are from cannabis plants with less than 0.3% THC; and hemp seeds have no THC or CBD.[1, 2]

This difference is important, as CBD and hemp are not psychoactive, and therefore cannot get you "high," whereas marijuana is psychoactive due to it containing higher levels of THC.[3]

Notably, the term marijuana is no longer widely used by most commercial cannabis producers as it has come to be associated with the idea that cannabis is a dangerous and addictive intoxicant, a stigma that has played a big part in slowing down cannabis legalization efforts throughout the U.S.[4]

WHAT IS HEMP AND IS IT LEGAL?

Hemp is found in a number of everyday products. Hemp has been grown for thousands of years, and continues to be a valuable commodity across cultures due to its multiple uses: it can be found in a wide range of foods and beverages, cosmetics, nutritional supplements, fabrics and textiles, yarns and ropes, construction materials, and paper products.[7]

Hemp was classified as a Schedule I substance until 2014, with no accepted medical use and a perceived high potential for abuse, making all cannabis cultivation in the U.S. illegal.[8] This political landscape began to shift after the passage of the 2014 Farm Bill which allowed hemp cultivation by certain research institutions and state departments of agriculture.[9] As a result of the success of these pilot programs, the 2018 Farm Bill federally legalized the production and distribution of hemp as long as the THC (the psychoactive component of cannabis) content remained 0.3% or lower. While the crop remains regulated, the law establishes a loose framework of shared oversight by federal, state, and Native American tribe authorities.

FARMING

As industrial hemp production increases, a number of farmers are beginning to turn toward regenerative agricultural practices. Regenerative agriculture includes farming and grazing practices that increase biodiversity, enrich soils, improve watersheds, and enhance overall ecosystem health.[10] These practices include no-till/minimum till as well as the application of cover crops, crop rotations, and compost.[11]

PESTICIDE USE

In 2019, the U.S. Environmental Protection Agency (EPA) approved the use of ten pesticides on hemp. Nine of these products are biopesticides and one is a conventional pesticide.[12] Prior to that time, no pesticides were registered by the EPA. According to a number of hemp farmers interviewed, some large, commercial hemp growers may be using unapproved chemically-derived pesticides, including insecticides to kill insects and fungicides to kill mildew. Some farmers may also be using the weed-killer glyphosate, although it is not approved for use at the federal or state level, primarily on the soils prior to planting in an effort to kill any weed-seed left in the soil. As hemp production continues to increase, it will be necessary for the EPA to enforce mandated hemp-specific pesticides to ensure streamlined and transparent hemp cultivation practices that include tolerance levels for allowed usage.

ORGANIC HEMP

Since the passage of the 2018 Farm Bill, organic certifiers can now certify hemp-derived products as organic under the "USDA Organic" program. A product can claim "produced with organic ingredients" if it contains at least 70% organic non-GMO ingredients, while the remaining 30% of ingredients are non-GMO.[13]

PROCESSING

The current extraction landscape within the hemp CBD industry is controversial due to the limited research regarding extraction methods as they relate to human health. The more traditional extraction method is liquid solvent extraction.

Examples of liquid solvents include ethanol, butane, alcohol, or isopropyl.[14] The solvent is run through the plant material stripping it of the cannabinoids which are transferred to the liquid. The liquid is then evaporated from the mixture, leaving the concentrated cannabinoids in an oil form.[15] The majority of ethanol is made from GMO corn that is heavily sprayed with glyphosate and other pesticides, and most GMO seeds are dipped in a class of pesticides called neonicotinoids that are known to be highly toxic to bees and other pollinators.[16]

Alternatively, the use of "supercritical carbon dioxide"—commonly known as CO2 extraction—has recently gained acceptance as a safer and potentially higher yielding extraction method.[17] CO2 extraction uses pressurized carbon dioxide to extract CBD from the plant while preserving CBD purity. Compared to traditional liquid solvent methods of extraction, CO2 extraction doesn't present any flammable petroleum-based solvents in contact with the finished product. Therefore shifting to the CO2 extraction method not only removes the risk of processing explosions, but also eliminates contact of potentially harmful byproducts in the extracted CBD oil. Another extraction method is lipid extraction. This method uses fats, or "lipids," to absorb and encapsulate the hemp-produced compounds. Often organic coconut oil is used in this extraction process. Lipid extraction does not require the use of any harsh solvents or CO2.[18]

If consumers want to ensure that products have not come in contact with ethanol, butane, alcohol, or isopropyl, they should purchase products that are USDA Certified Organic, which legally cannot contain ethanol derived from GMO corn. Similarly, consumers can avoid these harsh substances by purchasing products that use CO2 or lipid extraction methods.

EFFICACY IN CBD PRODUCTS

The potency of CBD products by milligrams (mg) of CBD or hemp extract can be found on the ingredients label or the product's packaging. It is important to note that potency is based on its recommended dosage, which varies by product. So when comparing products according to potency, consumers should look at the amount of CBD or hemp extract (measured in mg) listed on the product's label and compare that amount across products. In general, the amount of CBD taken depends on a range of factors including body weight, the condition being treated, and individual body chemistry.

Since the amount of CBD is not regulated or tested by FDA, producers should independently test their products for efficacy to ensure that their products contain the dosage of CBD that is advertised.

RECOMMENDATIONS FOR CONSUMERS

When purchasing CBD hemp products:

- **Look for products that are USDA Certified Organic:** Products that bear the "USDA Certified Organic" label is the only way to truly know if the product is produced using organic production methods, and grown without pesticides, GMOs, and other chemical inputs. A product can claim it is "Produced with Organic Ingredients" if it contains at least 70% organic ingredients, and the rest produced without GMOs. Note that a number of CBD companies state that their hemp is grown "naturally" or grown using "state of the art" farming

LAB PRODUCED CBD, COMING SOON?

A next wave of genetic engineering is synthetic biology, which is essentially the creation of engineered living organisms in a lab. Through synthetic biology, new genetic sequences are created from basic components and added to microbes, such as yeast. Several companies are currently working on creating CBD using synthetic biology instead of deriving it from the plants in which it occurs naturally.[5] Through the process of synthetic biology, new compounds including proteins may be created that have never been consumed by humans before, thus the impact of these compounds on our gut and overall health is unknown. FDA does not currently have an adequate regulatory process in place to conduct scientific review of these novel products or their potential impacts on humans. While this technology is still in its infancy, and regulation is lacking, CFS will continue to push for regulation of products using synthetic biology and for these products to be clearly labeled as genetically engineered.

techniques; these terms do not have any standards or regulations to back them up so are essentially meaningless.

- **Look for products that are independently certified:** Independent certification organizations—such as those that certify products as USDA Certified Organic, Sun + Earth Certified, or Non-GMO Project Verified as it becomes available—should be used to ensure the highest integrity of testing and promote consumer confidence. Other labels such as Fair Trade and SCS Pesticide Residue Free can clarify the practices that growers and producers use when developing their tinctures, capsules, and body lotions.
- **Check with the Non-GMO Project** for the current status of genetic engineering and GMOs in CBD and full spectrum hemp products. While the Project is not currently verifying CBD products, it monitors this category closely and offers education on how genetic engineering and GMOs are being used in ingredients and inputs.
- **Look for products that test for pesticides, glyphosate, and heavy metals:** Because hemp crops may be grown with—or contaminated by—pesticides or heavy metals such as lead, choose brands that do independent testing of their products. Companies should provide official results of product testing on their websites.
- **Look for products that test for potency:** Many companies test their products for potency to ensure that the dosage of CBD that is advertised on the product is accurate. Look for test results on company websites.
- **Consider the processing methods used:** Look for products that are USDA Certified Organic, use only "supercritical carbon dioxide," also known as "CO2 extraction," or use lipid infusion, if you want to avoid products processed with liquid solvents such as ethanol (which may be GMO), butane, alcohol, or isopropyl.
- **Contact your favorite hemp CBD producers** and encourage them to seek organic certification, change their production and processing practices to ones that are safer for human health and the environment, and provide results of independent testing labs on their website.

Together, we can ensure a clean and clear CBD industry for all!

A review of select companies producing Hemp CBD products can be found at: cfs.center/hempcbdscorecard

BIOREMEDIATION

Aside from its potential benefits to human health, hemp is also considered to be good for the environment. Hemp is a bioremediation plant, meaning it can break down hazardous substances found in soil and turn them into non-toxic or less toxic substances.[6] Studies have shown that hemp is an effective remediator of several toxic substances such as heavy metals, pesticides, and oil.[7] For example, in 2001 researchers confirmed that hemp was able to extract toxic materials from the Chernobyl site in Ukraine. Similar studies are underway in Italy and the U.S.—specifically at Colorado State University—to better understand the various ways hemp can be used for bioremediation.[8] While hemp may be used to clean up polluted areas, there may be unintended consequences in processing hemp planted in previously-polluted soils. Although there is limited research on the unintended consequences of bioremediation in hemp, it is important that hemp CBD brands test their products for pesticides and microbiological contaminants including heavy metals, VOCs, and mycotoxins to ensure that customers are not exposed to incidental contaminants in their final products.

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