



# Analytical Cannabis

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**APRIL 2019 DIGEST**

**FDA To Consider CBD  
As a Dietary Supplement**

**Israel Decriminalizes  
Adult Use Cannabis**

**European Union  
Considers Increasing  
Hemp's THC Limit**

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# Contents

<u>Canada's Illegal Cannabis Market is Still Strong But on the Decline</u>	<u>3</u>
<u>Cannabis Consumers Gain Less Weight Than Non-Users, Reports New Study</u>	<u>5</u>
<u>CBD Helps Deliver Medicine to the Brain</u>	<u>7</u>
<u>Combining Opioids and Cannabis May Be Advantageous for Pain Sufferers</u>	<u>9</u>
<u>European Union Considers Increasing Hemp's THC Limit</u>	<u>11</u>
<u>FDA To Consider CBD As a Dietary Supplement</u>	<u>13</u>
<u>Hash Users Smoking "Dangerous Amounts of Fecal Bacteria"</u>	<u>15</u>
<u>Israel Decriminalizes Adult Use Cannabis</u>	<u>16</u>
<u>Federal Cannabis Is Genetically Closer to Hemp Than Commercial Cannabis, According to Study</u>	<u>18</u>
<u>Chatting Cannabis with Amanda Feilding, the Countess of Psychedelic Science</u>	<u>19</u>



## Notes from the Editor

Jack Rudd

Welcome to the seventh issue of the Analytical Cannabis Digest, a free monthly resource covering the latest developments in cannabis extraction, science and testing.

This month we provide an update on the post-legalization perseverance of the illegal market in Canada, how CBD has shown potential as an additive to improve the delivery of certain drugs to the brain and, why the FDA is shifting its stance to consider CBD as a dietary supplement.

If you have an idea for a cannabis science related story or would like to contribute to our coverage of the industry, please feel free to email me at any time – [jack@analyticalcannabis.com](mailto:jack@analyticalcannabis.com)



# CANADA'S ILLEGAL CANNABIS MARKET IS STILL STRONG BUT ON THE DECLINE

By Alexander Beadle

Last month, Statistics Canada released the national economic accounts from the fourth quarter of 2018, the first full quarter in which legal adult use cannabis was available for sale in Canada.

This latest release is the first set of national economic accounts which endeavors to describe the scale of economic activity in the country that is directly related to the production and use of legal and illegal cannabis.

## Illegal cannabis sales down following legalization

While the illegal cannabis market remains strong in Canada, it is [on the decline](#). This is thought to be because the legal market is drawing recreational consumers away from the illegal market and into the regulated dispensaries and retail cannabis stores.

Cannabis-related expenditures are defined as the sum of household spending plus changes in the inventories of cannabis producers, plus cannabis exports, minus any imports. Together, these expenditures accounted for \$2.2 billion CAD (approx. \$1.645 billion USD), or 0.4 percent of GDP for the fourth quarter. Of this, illegal cannabis was estimated to be responsible for \$1.4 billion CAD (65 percent), with legal cannabis making up the remaining \$770 million CAD.

But despite this apparent dominance of illegal cannabis in Canada, a closer look at the individual statistics that make up the total economic activity reveal some interesting trends. Figures stated for household final expenditure on cannabis products put spending on illegal cannabis products at \$1.2 billion CAD, compared with \$307 million CAD in legal sales; and while this does mean that illegal cannabis represents approximately 79 percent of the nation's cannabis market at current prices, this is a marked decrease from the 90 percent market share that illegal cannabis had in the third quarter.

Statistics Canada also calculated that the cannabis inventories of licensed producers and distributors increased by an estimated \$461 million CAD over the fourth quarter, based on current cannabis prices.

## Supply issues plague early Canadian market

Despite legal cannabis making up over \$300 million CAD worth of household expenditure in its first full financial quarter, there are some who might be disappointed by these figures. Indeed, early projections for the future of Canada's cannabis industry predicting a future worth of roughly \$8 billion by 2021 [are already being revised](#) in light of the slow and bumpy rollout that recreational cannabis got in Canada.



The nation is currently in the throes of a [widespread cannabis shortage](#) as supply problems have left cannabis companies unable to meet consumer demand. Cannabis companies in some regions have been forced into temporary closure or to constrain their opening hours as a result of the shortage. This kind of supply issue will have had a knock-on effect on the economic figures reported and could have led to the introduction of legal cannabis having a lessened impact on the illegal market if consumers were having trouble accessing legal products.

In troubling news, it looks like [the shortage could drag on for years](#) as new types of cannabis product hit the market. Canada is [expected to legalize edible cannabis products](#) later in 2019, and industry experts fear this could exacerbate the current problem.

“If it was just the current product set, I’d say [the shortage would last] a year to 18 months,” said Chuck Rifici, CEO of the Toronto-based cannabis company Auxly, in an interview with CBC. “But because we have edibles and a bunch of new product types coming in October, I think it’ll be the better part of three years before we have true equilibrium and oversupply in the space.”

### **High cannabis prices might encourage illegal market**

On average, the Statistics Canada report appears to indicate that the aggregate price of cannabis increased by 1.5 percent in the fourth quarter compared to the previous quarter. However, this increase is thought to mostly reflect the introduction of legal cannabis products into the market.

Through the data crowdsourcing website [StatsCannabis](#), Statistics Canada was able to collect data on the average market price paid for cannabis flower. They found that the average price being paid for legal cannabis flower was around \$9.70 per gram. The price paid by legal consumers includes any excise duty or sales tax that would be applied to the product, and in the instance of online sales may also include any associated delivery fees. Reports of illegal cannabis purchases carried an average cost of \$6.51 per gram, a 32.9 percent decrease in price compared to the legal cannabis. As these data were anonymously self-reported and not collected from a randomized sample, Statistics Canada did preface its results with a disclaimer of caution.

However, this apparent large price difference, taken together with the product shortage problems affecting legal cannabis supplies, may explain why the legalization of cannabis has yet to have a dramatic impact on the illegal drug market in Canada, and by extension, why the market has [failed to live up to its past economic hype](#).





# CANNABIS CONSUMERS GAIN LESS WEIGHT THAN NON-USERS, REPORTS NEW STUDY

By Alexander Beadle

A new study from two researchers at Michigan State University suggests that adults who use marijuana could be less likely to be obese compared to non-users.

In the paper published in the *International Journal of Epidemiology* last month, researchers looked at data sets from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a cross-sectional, nationally representative study sample of American adults, to study the relationship between marijuana use and changes in bodyweight in respondents.

## Adults who consumed cannabis gained less weight on average

The researchers identified relevant information from responses to the 2001-2002 iteration of the NESARC interviews, such as age, height, bodyweight, and cannabis use, as well as less obvious variables, such as ethnic self-identification, alcohol use, tobacco use, and education attainment. Eligible participants for this study were respondents who answered all questions in both the original survey (dubbed 'Wave 1' or 'W1') and a follow-up done in 2004-2005 ('W2'). In total, there were over 33,000 eligible respondents that were reviewed as a part of this new study.

Cannabis use was split into one of four categories: 'persistent use', for respondents who reported cannabis use within 12 months; 'initiation', for those who had not used cannabis prior to W1 but had before W2; 'discontinuation or quitting', for those who reported some extent of use at or before W1, but had not used cannabis for 12 months prior to W2; and 'never use', for respondents who said they had never used cannabis in their lifetime. The changes in bodyweight were studied by calculating the respondents' body mass indexes (BMI).

After excluding participants over the age of 65 (as [previous research](#) suggests that weight loss and declining BMI is expected in older people due to natural loss of muscle mass), the researchers saw that while all of the subgroups gained weight from W1 to W2, people who reported using cannabis gained weight at a lower rate than the rest of the study population.

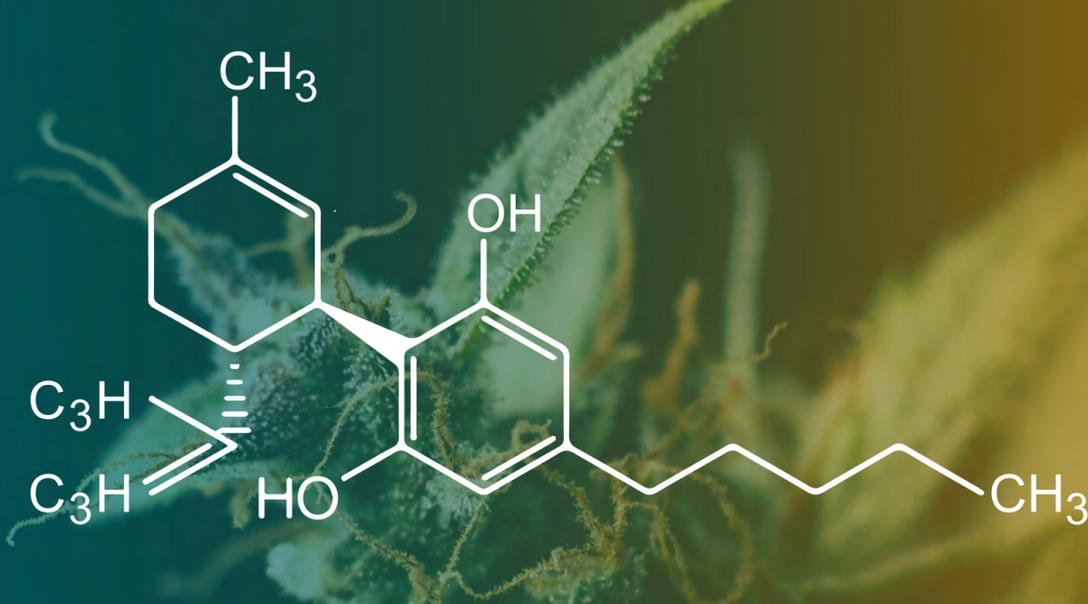
There was also an observed gradient looking across the subgroups of 'quitting', 'initiation', and 'persistent use', with those in the 'persistent use' group showing the most attenuated BMI gain. The 'persistent' and 'initiate' cannabis user groups were also under-represented in the group of people who reported being overweight (with a BMI of over 30 kg/m<sup>2</sup>) at the time of W2.

## Conflicting studies emphasize need for further study

The paper does note that there were a number of limitations on the study, including that the NESARC survey does not account for any variations in terms of physical activity or caloric intake. This means that it cannot be ruled out that the trends seen in this study might be down to the lifestyle and behaviors of the average cannabis user versus the rest of the population, rather than an actual medical effect caused by cannabis consumption, though previous studies have indicated that people who consume cannabis have a [higher caloric intake](#) and [lower physical activity levels](#) than non-users.

Many cannabis users anecdotally report that cannabis consumption increases their appetite, and a [recent analysis of junk food sales](#) in states with legal cannabis would support this claim. But this finding that cannabis use might curb weight gain will be comfort to more than just recreational cannabis users — medical marijuana is often touted as being a potential method of [treating the weight loss that often comes with HIV and cancer treatments](#). If the underlying mechanism for cannabis' effect on bodyweight can be properly characterized, it might lead to a more effective medical solution for these kinds of patients.





# CBD HELPS DELIVER MEDICINE TO THE BRAIN

Original story from the American Chemical Society

Cannabidiol (CBD), a non-psychoactive compound in cannabis, is being touted as beneficial for many health conditions, ranging from anxiety to epilepsy. Although much more research is needed to verify these claims, scientists have now shown that CBD could have a different use as a “Trojan horse”: helping slip medications across the blood-brain barrier (BBB) and into mouse brains. The researchers report their results in [the ACS journal \*Molecular Pharmaceutics\*](#).

The BBB consists of a layer of tightly linked cells that line capillaries in the brain, preventing substances from exiting the blood and entering the brain. However, the BBB does permit some molecules to pass, such as glucose and certain amino acids and neurotransmitters. For example, a class of neurotransmitters called endocannabinoids bind to proteins called cannabinoid receptors in the BBB, and the receptors help transport the molecules across the barrier and into the brain. Ana Torres-Suárez and colleagues wanted to make use of this system to sneak drug nanocarriers into the brains of mice.

To do so, the researchers attached CBD, which resembles endocannabinoids made by both mice and humans, to the outside surfaces of lipid nanocapsules. Instead of loading the nanocapsules with a medication, the researchers packaged them with a fluorescent molecule so they could track the particles. In experiments with human brain cells that mimic the BBB, the

researchers showed that the CBD-displaying nanocarriers caused more of the fluorescent molecule to pass through the cells than nanocarriers of equal size that lacked CBD. Similarly, when injected into healthy mice, the CBD-nanocapsules targeted about 2.5 times more of the fluorescent molecule to the animals’ brains.

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## Reference

1. Juan Aparicio-Blanco, Ignacio A. Romero, David K. Male, Karla Slowing, Luis García-García, and Ana I. Torres-Suárez. Cannabidiol Enhances the Passage of Lipid Nanocapsules across the Blood–Brain Barrier Both in Vitro and in Vivo. *Molecular Pharmaceutics*, 2019; DOI: 10.1021/acs.molpharmaceut.8b01344



# COMBINING OPIOIDS AND CANNABIS MAY BE ADVANTAGEOUS FOR PAIN SUFFERERS

Original Story from Experimental Biology

Researchers report combining cannabinoids with morphine did not significantly increase impulsivity or memory impairment in a study conducted in rhesus monkeys. The findings suggest using opioids and marijuana together could offer a safe way to cut opioid dosage among patients suffering from pain and thereby reduce their risk of becoming addicted to opioids.

"These data provide additional evidence supporting the notion that opioid-cannabinoid mixtures that are effective for treating pain do not have greater, and in some cases have less, adverse effects compared with larger doses of each drug alone," said Vanessa Minervini, PhD, a postdoctoral fellow at the University of Texas Health Science Center at San Antonio.

Minervini will present the research at the [American Society for Pharmacology and Experimental Therapeutics](#) annual meeting during the [2019 Experimental Biology meeting](#), held April 6-9 in Orlando, Florida.

Previous studies have suggested the cannabinoids in marijuana enhance some of the pain-relieving effects of opioid drugs but do not enhance effects related to addiction and overdose. However, both drugs individually are known to slightly impair cognition, leading to a concern that such side effects could be amplified if opioids and marijuana are used together. Researchers say the new study offers encouraging evidence this is not the case.

The research comes amid a national opioid abuse crisis in which many addictions start with opioids prescribed for pain. At the same time, marijuana use is on the rise as more states legalize the drug for medical or recreational use.

"The current opioid epidemic underscores the need for safe and effective pharmacotherapies for treating pain," said Minervini. "Combining opioid receptor agonists with drugs that relieve pain through actions at non-opioid mechanisms (for example, cannabinoid receptors) could be a useful strategy for reducing the dose of opioid needed to achieve pain relief." The researchers gave several monkeys moderate doses of morphine and CP55940, a synthetic drug that mimics the activity of the tetrahydrocannabinol (THC) naturally found in marijuana. They assessed impulsivity and memory with tests involving touchscreens and treats. The results showed each drug impeded performance and that giving the monkeys both drugs together had a lower effect on performance than either drug alone. While clinical trials would need to be conducted to confirm whether these results translate to humans, monkeys tend to process drugs similarly to humans and are considered a good model for cognition.

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# EUROPEAN UNION CONSIDERS INCREASING HEMP'S THC LIMIT

By Alexander Beadle

The European Union could soon change its legal THC levels in approved hemp varieties from 0.2 percent to 0.3 percent. The possibility stems from the European Parliament Committee on Agriculture and Rural Development's [recent approval of a batch of proposals](#) for reforms to the EU's Common Agriculture Policy (CAP).

Among these amendments is the [proposal that would increase the allowable THC levels](#) in hemp back up to 0.3 percent to be in line with non-European countries, such as the US and Canada. Some had called for the levels to be increased to 1.0 percent, to match the legislation in neighboring Switzerland. But a smaller increase was thought to be the most favorable and have the best chance to pass a vote.

The [amendment has been approved](#) by the committee, but it will still need to be agreed to by the full EU Parliament and the EU Council. If these bodies further ratify the measure, the new 0.3 percent limit could come into effect as early as January 2021.

Previously, the EU limit on THC in hemp has been as high as 0.5 percent, but [waves of reform](#) over the past few decades have driven the limit lower and lower.

In 1984, when THC limits were first determined in Europe, this 0.5 percent limit was set to reflect the scientific beliefs of the time. After just three years, this cap fell to 0.3 percent as a measure for the "protection of public health". And in 1999, the limit

fell once again to 0.2 percent, where it has remained until this day.

According to [the European Industrial Hemp Association](#) (EIHA), this was done to "prevent the cultivation of illicit drug type cannabis in industrial hemp fields", but they argue that "no evidence was ever presented to support this opinion", and so the limit should be amended back to pre-1999 standards.

Reacting to the recent committee vote, Lorenza Romanese, the Managing Director of EIHA, told [HempToday](#), "[the vote] represents a major step forward for the sector. EIHA worked hard to assure the positive vote."

The EIHA believe that raising the limit, even incrementally, will help the European hemp industry keep pace with the competition in North America and in Asia. Romanese says that the current rules on THC levels "restrict the choice of varieties for European farmers". Currently there are [around 60 varieties of hemp](#) that are available for European farmers, but the EIHA believe that raising the limit will encourage a greater diversity of products in the European hemp market.

In addition to maintaining a healthy and competitive industry, [the EIHA also argue](#) that "there is no reason for a THC limit of 0.2 percent" and state that "0.2 percent [THC containing hemp varieties] are as safe as 0.3 percent [varieties] regarding drug abuse and there will be no noticeable effect on illicit cannabis production [from changing the limit]."





# FDA TO CONSIDER CBD AS A DIETARY SUPPLEMENT

By Leo Bear-McGuinness

The US Food and Drug Administration have announced that it will hold a public hearing next month to discuss whether CBD can be marketed as a dietary supplement in foods and beverages.

In a [press statement](#), the current FDA Commissioner Dr Scott Gottlieb described the hearing, which will [take place on May 31st](#), as an opportunity for the public to inform “lawful pathways by which appropriate products containing cannabis or cannabis-derived compounds can be marketed, and how we can make these legal pathways more predictable and efficient.”

The hearings will also be a chance for the FDA to “gain additional information and data to consider with respect to products containing cannabis and cannabis-derived compounds.”

The public meeting could be a turning point for the FDA’s stance on CBD, which has been mostly restrictive. As recently as December last year, the organization stated it could not permit any hemp-derived cannabinoid to be marketed as a dietary supplement in foods or beverages. In [that statement](#), Gottlieb wrote that it was “unlawful under the [Federal Food, Drug and Cosmetic Act] to introduce food containing added CBD or THC into interstate commerce, or to market CBD or THC products as, or in, dietary supplements, regardless of whether the substances are hemp-derived.”

The decision was a major blow to many in the CBD industry that were hoping the 2018 farm bill could be a boon for the CBD-infused edibles and drinks market. But the FDA’s new public hearing may be a sign that the administration is willing to soften its stance on the popular cannabinoid, at least when it’s marketed as a dietary supplement.

When it comes to advertising a product for its supposed medical benefits, the FDA still doesn’t take any claim lightly.

“I am deeply concerned about any circumstance where product developers make unproven claims to treat serious or life-threatening diseases,” Gottlieb wrote in the recent press statement. “And where patients may be misled to forgo otherwise effective, available therapy and opt instead for a product that has no proven value or may cause them serious harm.”

Using the letter to decry businesses that make unsubstantial claims about cannabis’ medical properties, the commissioner named and shamed three companies and listed some of their “egregious, over-the-line claims,” which included:

- “CBD successfully stopped cancer cells in multiple different cervical cancer varieties.”

- “For Alzheimer’s patients, CBD is one treatment option that is slowing the progression of that disease.”
- “CBD reduced the rewarding effects of morphine and reduced drug seeking of heroin.”

While egregious as a marketing tool, some of these claims can be traced back to real clinical studies. For example, cannabis compounds have been shown to [inhibit the growth of cervical cancer cells lines](#). But due to fierce international regulation, results such as these are rarely tested in randomized human clinical trials. Without surpassing this professional golden-standard, it’s practically impossible for any marketed medical benefit to be approved by the FDA, let alone be endorsed by medical bodies.

“We won’t tolerate this kind of deceptive marketing to vulnerable patients,” Gottlieb

continued. “These products have not been shown to be safe or effective, and deceptive marketing of unproven treatments may keep some patients from accessing appropriate, recognized therapies to treat serious and even fatal diseases.”

However, while CBD and THC are still viewed harshly by the FDA, Gottlieb has made clear in the past that foods derived from hemp plants that don’t contain the cannabinoids could be marketed with FDA approval. Following the passing of the farm bill in December 2018, [he wrote](#) that the FDA had little issue with hulled hemp seeds, hemp seed protein, and hemp seed oil being marketed in human foods, provided they too “comply with all other requirements and do not make disease treatment claims.”

For now, and until the new public hearing in May, these hemp products are still the only cannabis-infused foods allowed to marketed as dietary supplements in the US.



# HASH USERS SMOKING “DANGEROUS AMOUNTS OF FECAL BACTERIA”

By Leo Bear McGuinness

Most cannabis sold on the streets of Madrid is not suitable for human consumption, according to a new study.

Samples of unregulated drugs from the Spanish capital often contained dangerously high levels of E.coli bacteria and Aspergillus fungus.

The analysts found that hashish wrapped up in plastic “acorns” was the most contaminated, which is unsurprising given the reported region of the body they were smuggled inside. Around 40 percent of these samples had a fecal aroma, according to José Manuel Moreno Pérez, the study’s lead author.

Speaking to the Spanish newspaper *El País*, Pérez described that the acorns were more likely to be contaminated because the cannabis samples were wrapped up in plastic packets and swallowed by the drug smugglers. These contraband-containing people would then “take a laxative and expel” the pellets in a toilet.

Pérez, a pharmacologist at the Universidad Complutense in Madrid, sourced the cannabis directly from street dealers. His research team

then sorted the 90 samples by shape, depending on whether they resembled “acorns” or “ingots”, to see if shape and packaging were variables for contaminants, which they were.

In a research paper published in the journal [Forensic Science International](#), the team detail how a significant 93 percent of the acorn-shaped samples contained threatening levels of E.coli bacteria, compared to 29.4 percent of the ingot samples. While most varieties of E.coli bacteria are relatively harmless, some can cause severe abdominal cramps, bloody diarrhoea, and vomiting.

Around 10 percent of cannabis samples were also covered with Aspergillus, a dangerous fungus that can cause chest infections and other illnesses in people with weaker immune systems.

Given the high risks of both these microorganisms, the researchers concluded that 88.3 percent of samples were not suitable for consumption. The authors are now calling the situation a “public health issue” and warning those with weaker immune systems, such as cancer patients, to avoid street-sold cannabis all together.



# ISRAEL DECRIMINALIZES ADULT USE CANNABIS

By Alexander Beadle

April Fool's Day is perhaps an odd date to enact new changes in cannabis laws, but that is exactly what happened in Israel this month.

On April 1, the same day former Israeli prime minister [Ehud Barak addressed the fourth annual CannaTech](#) medical cannabis conference in Tel Aviv, new laws came into effect which now [partially decriminalize](#) the use and possession of adult use cannabis.

Under the new regulations, the recreational use and possession of small amounts of cannabis will no longer be treated so harshly. People found in possession of small amounts of cannabis in public will [now be subject to a fine](#) of 1,000 shekels (around \$275) rather than criminal proceedings. This fine will be doubled for a second offense. Only on the third offense within a period of seven years will a criminal investigation be triggered, or the person may be asked to surrender their driver's or gun license. This change to the law does not apply to members of the Israeli military, minors, or anyone with a past criminal record.

The new legislation does not strictly define what amount might be considered for personal use, but the Israel Anti-Drug Authority has previously considered this to [be around 15 grams](#). Medical cannabis patients have been advised to always keep their medical marijuana cards on their person in case they are approached by law enforcement.

The decriminalization came about on account of a [recommendation given by a government committee](#) which wanted to move the focus on cannabis related offenses from the criminal jurisdiction to the education realm. The recommendation was adopted and became the foundation for this legislation. The new rules are only intended to last for the next three years, after which the Israeli government, the Knesset, will make the decision on whether to make the reform permanent.

Despite these good intentions from the committee, the reform has drawn a number of critics. [Speaking to the Haaretz newspaper](#), a representative from the Green Leaf party expressed concerns over the technicalities of the decriminalization.

"The reform is partially welcomed but it does an injustice to users who don't have the means to pay the fine, and to minority groups whose abuse will continue through profiling," said Boaz Wechtel, the founder of the party. "The police will continue to violate individual liberties without grounds. Only full legalization or regulation will bring justice to users of this magical plant and take control away from the black market and terror organizations"

## Medical cultivation license applicants rise with legislation changes

Decriminalization isn't the only change to its cannabis law that Israel has made recently;

the country has also announced a [reform of its medical cannabis regulation](#) that would let patients purchase medical cannabis directly from pharmacies with a physician's prescription. Hundreds of doctors are scheduled to undergo training that will qualify them to prescribe the drug for treatment.

This reform was also initially meant to come into effect on April 1, but has been rescheduled for the end of the month. The reason behind the change of schedule is unclear.

In anticipation of these new reform measures, the Israeli Ministry of Health has reportedly received over 550 requests from farms to apply for a medical cannabis cultivation license.

"So far, 565 farms have submitted requests to the Ministry of Health to obtain licenses to grow medical cannabis," said Eyal Basson, a spokesperson from the Ministry, [to Ynetnews](#). "Of these, 384 have already passed the first round of tests in the licensing process, and this was after they underwent police checks and land ownership verification."

"Six farms are currently approaching the end of the third stage of the licensing process and have already established farms that successfully passed security checks as well as agricultural quality tests. In addition, another eight farms have completed all the tests and have received work permits."

Recently, Israel has been struggling with a [shortage of medical cannabis](#), driving some medical companies to closure. It is hoped that the influx of cultivation applications will soon help address the shortage.

### Cannabis and Israeli politics

The changing of cannabis policy is by no means the greatest source of political change in Israel right now. The country is currently in the middle of a national election, in which both the sitting Prime Minister Benjamin Netanyahu of the Likud party, and Benny Gantz of the Blue and White alliance, have [declared a victory](#).

At the time of writing, only 97 percent of the votes have been counted, but it appears that though both parties have won 35 seats each in the 120-seat Knesset, Prime Minister Netanyahu will remain in office for a fifth term as his party looks the most [able to form a majority coalition](#) using its links to other far-right and religious parties elected to the Knesset. Gantz' more centrist party has fewer potential political allies to form a government

with. The final official vote tally is expected to be announced some time on Friday, April 12, the coalition building process to form a majority government is expected to take several weeks.

Leading up to the vote, cannabis was a hot topic in the election coverage. Moshe Feiglin of the new far-right ultra-nationalist Zehut party, brought the issue to the forefront with his [dramatic political platform](#) which promised a complete legalization of cannabis, alongside an overhaul of the country's finance ministry, the rebuilding of biblical temples in Jerusalem, and a call to annex the occupied West Bank and Gaza Strip.

[No party since 1949](#), the year of Israel's first election, has managed to win an outright majority in the Knesset, meaning that the country is normally ruled by some sort of coalition between parties with a similar economic or social outlook. In the run up to this election, Feiglin's party experienced a surge in the polls, leading it to be dubbed a potential "[kingmaker](#)" after Feiglin did not offer public assurances to either the Likud party of the Blue and White alliance that he would support their candidates in the formation of a coalition. He repeatedly stated that in order to offer support he would need a promise in return of full cannabis legalization and control over the finance ministry. These red lines drew his platform even further into the limelight as the media looked to explain this surge, often [linking his promises to reform cannabis law with increasingly vocal support from young voters](#).

With just 3 percent of the nation's votes left to be counted, Feiglin's Zehut party sits on just over 101,000 votes, or 2.51 percent of the total vote. Unfortunately for Feiglin, this leaves his party [30,000 votes short of the minimum threshold](#) needed to be awarded a seat in the Knesset — a stiff blow to a party that was thought to be a kingmaker. Feiglin believes that a last-minute announcement from other right-wing parties declaring that they would refuse to form a coalition with the Zehut party damaged his party's prospects, and that this sort of coordinated effort is to blame for his party's failure to secure a seat, not his policies.

Still, no matter the result of the election, Feiglin's campaign did promote further discussion of Israel's cannabis policy. In March, as the political campaigns were underway, prime minister Netanyahu mentioned that his party would be [willing to "consider" cannabis legalization](#) in an effort to target Feiglin's base and to attract voters from the pro-cannabis Green Leaf party, which did not field candidates in this general election.



# FEDERAL CANNABIS IS GENETICALLY CLOSER TO HEMP THAN COMMERCIAL CANNABIS, ACCORDING TO STUDY

By Alexander Beadle

Research-grade cannabis from the United States' only federally authorized cultivation site is genetically closer to hemp than the cannabis offered in the nation's dispensaries, according to [a new pre-print study](#) from researchers at the University of Northern Colorado.

This could have huge implications for researchers who are using this research-grade material for clinical study. For one, the effects from consuming this cannabis may not be the same as those of the products bought and sold in dispensaries.

## Previous research on this cultivation site

The University of Mississippi operates [a facility](#) that cultivates cannabis strains specifically for research purposes. The facility is funded through the National Institutes of Health/ National Institute on Drug Abuse (NIH/NIDA) and is the sole cultivation site in the United States to have received official licensing from the Drug Enforcement Agency (DEA) to carry out operations. The cannabis materials that it provides also meets the legal and safety requirements of both the DEA and the Food and Drug Administration (FDA). While cannabis remains federally illegal, thereby [restricting the ability of institutions to access cannabis from any other source](#) while still receiving federal research funding, the NIDA

cannabis source at the University of Mississippi is the most common origin point of the cannabis being used in today's research.

While the cannabis supplied by the NIDA source is typically used as a part of trials to better understand the effects of cannabis on the human body, several studies, such as Northern Colorado's new research, have focused on the cannabis material itself.

Previously, cannabis strains grown at the NIDA facility have been shown to contain dramatically different levels of major cannabinoids compared to commercially available cannabis. [One 2017 paper](#) found that varieties of cannabis from the institute contained only 27 percent of the tetrahydrocannabinol (THC) levels and 48 percent of the cannabidiol (CBD) levels of commercially available cannabis strains. The NIDA's varieties also contained anywhere from 11-23 times as much cannabitol (CBN) content as commercial cannabis.

Given that previous research has indicated a difference in cannabinoid content between NIDA cannabis and commercially available products, the researchers at the University of Northern Colorado felt that a genetic investigation of the cannabis source was warranted to determine if

the NIDA cannabis is also genetically distinct from the more popular commercial strains.

### NIDA cannabis shares “genetic affinity” with hemp

The new study looked at 49 cannabis samples, including varieties of wild hemp, cultivated hemp, high CBD cannabis, and several cannabis strains from each of the three broad categories of Sativa, Indica, and Hybrid, alongside two samples of NIDA cannabis. DNA was extracted from each sample, and using the programs GENALEX, STRUCTURE, Maverick, and EDENetworks, it was possible to visualize the genetic relationships between each sample.

Clustering analysis of the genetic variation shows the drug-type strains (Sativa, Indica, Hybrid, and high CBD) all occupying the same character space, with the hemp samples clearly separated. Given that hemp and cannabis are [known to be genetically different](#), this result is expected. The NIDA cannabis samples, however, cluster within the same space as the hemp samples, implying a closer genetic makeup than previously thought.

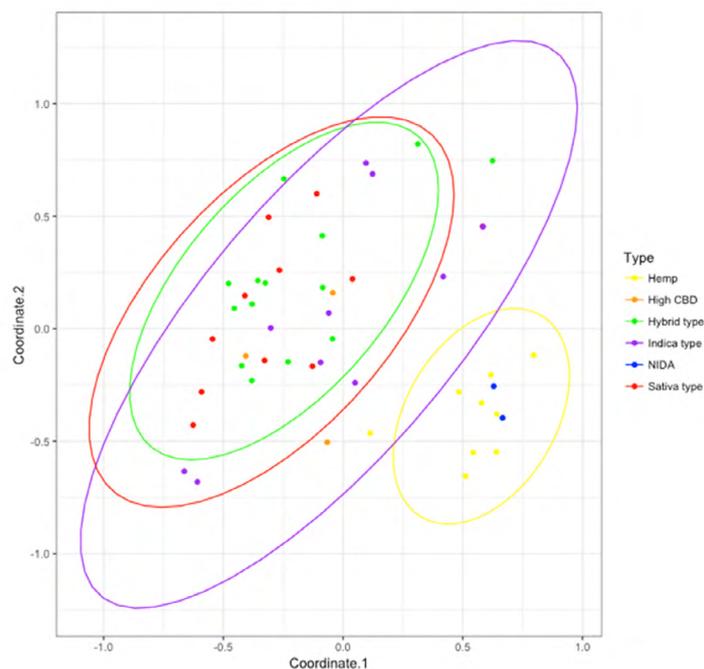


Image via bioRxiv



REN ROX FOR WIRED

# CHATTING CANNABIS WITH AMANDA FEILDING, THE COUNTESS OF PSYCHEDELIC SCIENCE

By Leo Bear-McGuinness

Dubbed the Acid Countess, the Queen of Consciousness, and the Countess of Psychedelic Science, Amanda Feilding's greatest achievement may be how she surpasses her own regal reputation. Born heir to "Brainblood Hall", a Tudor country estate where she still resides, Feilding's life could read like one of the very LSD trips she's famed for. From her teenage pilgrimage to meet her spy-catcher godfather in Sri Lanka, to her study of mysticism, to [boring a hole in her own skull](#) in an effort to expand her consciousness, the frenzied stories surrounding Feilding would put a '60s rock star to shame.

Unfortunately, these thrilling tales threaten to overshadow Feilding's real legacy. Because behind the bohemian anecdotes stands a giant of drug research and policy reform.

"I set up the Beckley Foundation to enable scientific research and change global drug policy. And we've done both," says Countess Feilding. First named the Foundation for Further Consciousness, Feilding's [Beckley Foundation](#) is a think tank like no other. Based out of her own "Brainblood Hall", the foundation leads pioneering research into psychoactive substances, while championing their benefits on the global drug policy stage.

"I organized meetings of international leaders from all disciplines; the home secretary would

come, the head of NIDA (the National Institute of Drug Abuse), all sorts of key people," she continues. "I held them at the House of Lords and they were very influential in helping form an evidence base, which is what we needed in order to reform drug policy. Because the international conventions impose prohibition not on scientific evidence but on expediency, prejudice, and convenience."

Driven by this sharp critique of international regulations, Feilding went on to publish several influential reports, such as [Cannabis Policy: Moving Beyond Stalemate](#), which according to the countess, became imperative in reforming US state laws; "I was told they used it as a Bible for changing their policies," she says.

But while this destination of policy change was vital, for Feilding, it was the journey that was most inviting. "Actually, working on policy is my least favorite occupation," she clarifies. "I only work on policy because I desperately want to work on the scientific understanding of the potential benefits of cannabis, and indeed, the psychedelics."

This quest for a 'psychedelic evidence base' soon led Feilding to found several scientific studies into the benefits of psychoactive drugs. Beginning in 2005, she set up a research programme at the revered Imperial College London university with

Professor David Nutt, a prominent drug policy reformer, notable in the UK for being [sacked as the government's chief drug adviser](#) after claiming that ecstasy and LSD were less dangerous than alcohol.

Since then, the programme has published numerous studies to scientific acclaim. From showing how psilocybin (the psychedelic drug compound in 'magic mushrooms') [can treat depression](#), to how [LSD can modulate one's ego](#), the programme's unique research has helped lay the foundations of the UK's psychoactive knowledge base.

And when it comes to cannabis, the Beckley Foundation may just have prompted more marijuana research than any other European institution. Over the past decade alone, it's birthed studies showing how [CBD can block the psychotogenic effect of THC](#), how THC's effects [might be related to poor communication](#) between the brain's right and left frontal lobes, and how [cannabis use can even increase the divergent thinking](#) associated with creativity. And it's this last benefit, in particular, that's emblematic of Feilding's passion for her work.

"There are many benefits of changing consciousness, such as loosening the connections, being more creative, and open and able to think outside the box," she says. But Feilding's also keen to highlight how many people, particularly those within communities of color, have been unfairly treated for seeking these benefits. "It's a very popular way of discriminating against minorities, particularly minorities of color, who then go to prison, both in England and America at a much higher rate than Caucasians," she adds. "So it's been a very, very damaging period."

Of course, for the people [disproportionally arrested for marijuana possession](#) and for the long-time campaigners like Feilding, this damaging

period is still far from over. The fight to end prohibition and prejudices is still to be won. "The first move should definitely be to decriminalize the use of drugs," she states. Citing the progressive drug policies of Portugal under the government of António Guterres, Feilding stresses that the UK and other countries' restrictive laws are in desperate need of similar reform, if not more radical. "They've had amazing results; from being the highest death rate in Europe they're now among the lowest. But they haven't yet regulated it."

"And there are many economic advantages in a regulated market," she continues. "[Our report](#) showed that over a billion pounds was a fairly minimum starting point of what the government would gain in regulating and taxing cannabis. Because the cost of cannabis is quite low. The trouble is now, in the regulatory system that is being created at the moment, the cannabis is coming out extremely expensive, which stops people being able to purchase it. And that again is a mistake. It should be available at a reasonable price."

Whether the UK progresses to an affordable, regulated cannabis market remains to be seen. But in these unique times when other countries are fully legalizing marijuana and new industries are springing up around it, a prohibition-free future may just be possible. Until then, this 76-year-old campaigner still has work to do.

"It's a wonderful gift of nature, which prohibition has obstructed making use," she says. "Many traditional cultures have used it for millennia and hopefully we will learn from them and introduce it into our cornucopia of pharmacological treatments. And not criminalize people who decide that they find it beneficial to their wellbeing. So, I think we're on right side of the tide turning. And that's the wonderful thing."