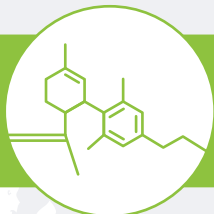
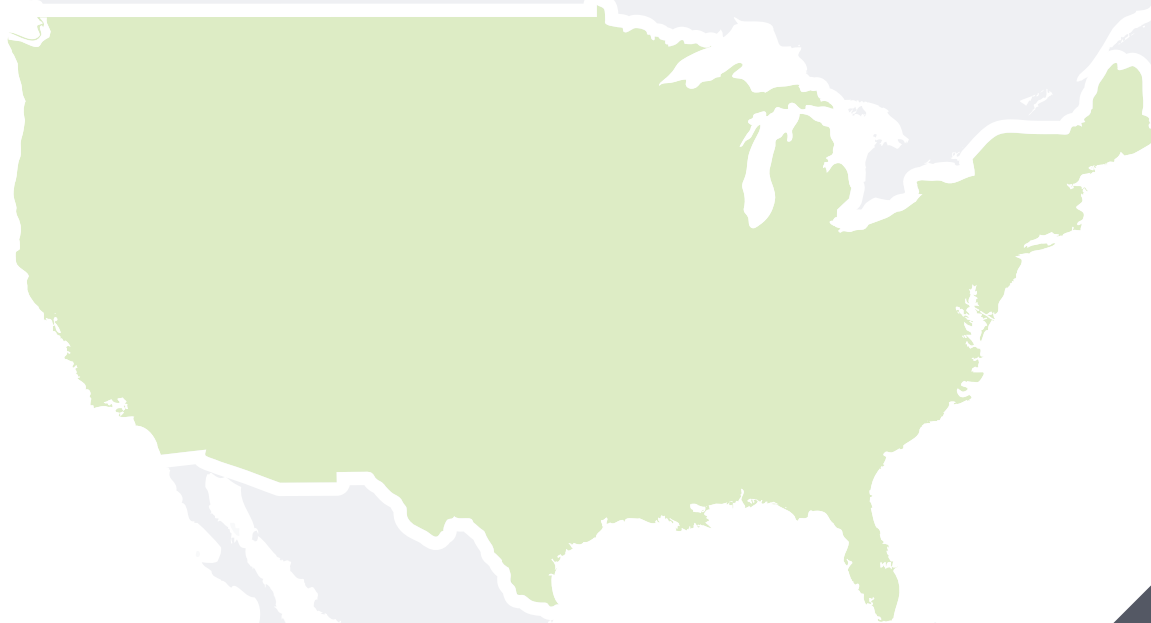


VOL. I

U.S. HEMP MARKET REPORT



Cannabinoids Edition



Sponsored by:

GROFF
NORTH AMERICA

+FARMACY
HEALTH

Hemp
Business
Journal

A division of: New Frontier Data

letter from the PUBLISHER

NEW FRONTIER DATA, is proud to have partnered with Groff North America and Farmacy Health, and to introduce its U.S. Hemp Report Series, starting with **Cannabinoids Edition**, the first volume of three separate studies examining the increasingly expansive potential of the hemp and CBD markets in the U.S..

Developments in cannabinoids regulations, consumer behavior, and in the global hemp supply chain are shaping what is now a competitive post-legalization CBD market. This report summarizes the major market developments at play to better understand, assess, and plan for, hemp and CBD market future growth in the U.S..

To date, 16 U.S. States explicitly allow CBD to be added to the *food* products category under FDA regulation. As the FDA continues to evaluate CBD for safety and tolerance levels, pressure remains on the agency to provide prudent guidance, while some efforts are underway in Congress to bypass the agency altogether. Given the outbreak of COVID-19 and the slowed legislative pace during a presidential election year, little movement is expected on the bill.

Nonetheless, investors and producers remain bullish toward the CBD market and its regulatory future; and while the industry continues to be built on uncertain regulatory grounds, the FDA's final rulings on CBD-infused foods will be a critical determinant of the market's growth trajectory.

As is the case with all of the reports available through New Frontier Data's online intelligence portal Equio™, we trust that readers will benefit from this report's findings, our unbiased insights, and the actionable intelligence provided, to continue to succeed in the global legal cannabis arena.

New Frontier Data's mission is to elevate the discussion around the legal cannabis industry worldwide by providing unbiased and vetted information intended to educate stakeholders in making informed decisions. We provide individuals and organizations operating, researching, and investing in this emerging industry with unparalleled access to actionable business intelligence and market insights, helping each to leverage the power of knowledge to succeed in a fast-paced and dynamic market.

Please do enjoy our newest report as you shape your strategy and devise your action plan within the hemp and CBD industry!



Giadha A. de Carcer
Founder and CEO,
New Frontier Data



Strength in Knowledge®



ABOUT

New Frontier Data

NEW FRONTIER DATA is an independent, technology-driven analytics company specializing in the global cannabis industry. It offers vetted data, actionable business intelligence and risk management solutions for investors, operators, researchers, and policy-makers. New Frontier Data's reports and data have been cited in over 85 countries around the world to inform industry leaders. Founded in 2014, New Frontier Data is headquartered in Washington, D.C., with additional offices in Denver, CO, and London, UK.


New Frontier Data does not take a position on the merits of cannabis legalization. Rather, its mission and mandate are to inform cannabis-related policy and business decisions through rigorous, issue-neutral, and comprehensive analysis of the legal cannabis industry worldwide.

For more information about New Frontier Data, please visit: NewFrontierData.com.

Mission

New Frontier Data's mission is to elevate the discussion around the legal cannabis industry worldwide by providing unbiased and vetted information intended to educate stakeholders in making informed decisions.

Core Values

-  Honesty
-  Respect
-  Understanding

Vision

Be the Global Big Data & Intelligence Authority for the Cannabis Industry.

Commitment to Our Clients

The trusted one-stop shop for actionable cannabis intelligence, New Frontier Data provides individuals and organizations operating, researching, or investing in the cannabis industry with unparalleled access to actionable industry intelligence and insight, helping them leverage the power of big data to succeed in a fast-paced and dynamic market.

We are committed to the highest standards and most rigorous protocols in data collection, analysis, and reporting, protecting all IP and sources, as we continue to improve transparency into the global cannabis industry.



Report Contributors

PUBLISHER

Giadha A. DeCarcner, Founder & Chief Executive Officer, *New Frontier Data*

EDITOR

John Kagia, Chief Knowledge Officer, *New Frontier Data*

AUTHOR

Trevor Yahn-Grode, Industry Analyst, *New Frontier Data*

ADDITIONAL ANALYSIS

William Sumner, Senior Manager, Hemp Market Content, *New Frontier Data*

COPY EDITOR

J.J. McCoy, Senior Managing Editor, *New Frontier Data*

PROJECT MANAGEMENT

Hovanes Tonoyan, Project Manager, *New Frontier Data*

Copyright

Copyright © 2020 by Frontier Financial Group, Inc., dba/ New Frontier Data. All rights reserved. Photocopying or reproducing this report in any form, including electronic or facsimile transmission, scanning or electronic storage, is a violation of federal copyright law and is strictly prohibited without the publisher's express written permission.

This report may not be resold. New Frontier Data only sells its publication directly or through authorized resellers. Information concerning authorized resellers may be obtained from New Frontier Data, 1400 I Street NW, Suite 350, Washington D.C., 20005.

While every effort has been made by New Frontier Data, Inc. to ensure the accuracy of information in this report, it accepts no responsibility for errors or omissions. The report is sold as is, without warranty of any kind, either express or implied, respecting its contents, including but not limited to implied warranties for the report's quality, performance, merchantability, or fitness for any particular purpose. Neither New Frontier Data nor its dealers or distributors shall be liable to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by this report.



CANNABIS DATA AT YOUR FINGERTIPS

Introducing Equio's Data Marketplace

- Consumer Trends Data –
- Global Market Data –
- Hemp Data –
- North American Industry Data –



equio | CONQUER
THE WILD

Learn more at: Equio.solutions
or email us at: Sales@NewFrontierData.com

GROFF

NORTH AMERICA

Medical Grade Cannabis Ingredients



+ FARMACY

HEALTH

Integrated Cannabis Health System

U.S. Hemp Market Report: **CANNABINOIDS EDITION**

1 Executive Summary

KEY FACTORS SHAPING THE MARKET FOR CANNABINOIDS

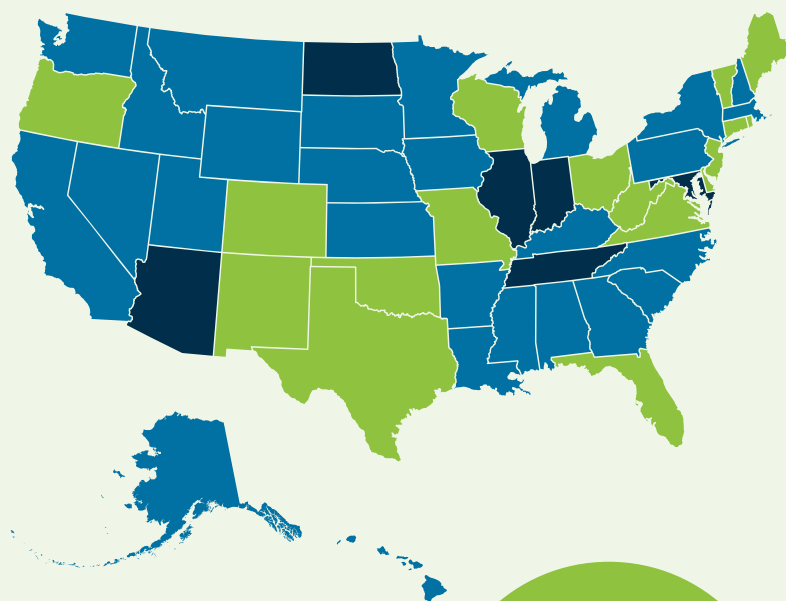
The competitive landscape of the post-legalization market has been shaped largely by developments in the regulatory and legal status of cannabinoids, consumer behavior, and the global hemp supply chain. This report summarizes the major market developments in those areas over the past year, and provides an outlook for the market's future growth.

2 Regulatory & Legal Status of Cannabinoids

DISPARATE APPROACHES CREATED BY LACK OF FEDERAL CLARITY ABOUT REGULATION

While the U.S. Food and Drug Administration (FDA) has long promised to create clear pathways to approval for CBD products, the agency's stance is that it remains illegal either to add CBD to food or beverages, or to market it as a dietary supplement. Impatient with the FDA's position as demand for CBD has expanded, several states have adopted independent stances, many of them in direct contradiction to the FDA.

STATE STANCES ON CBD IN FOOD PRODUCTS



- Explicitly Allow
- Ambiguous Stance
- Explicitly Forbid

16
States

Explicitly allow CBD
in food products*

**Vermont allows CBD in food under strict limitation, New Mexico allows CBD in food but is actively legislating a ban, and Wisconsin requires that any CBD-infused food be produced in-state.*

Source: New Frontier Data



At the time of this report, 16 states were explicitly allowing CBD to be added to food products. As the FDA continues to evaluate CBD for safety and tolerance levels, efforts are underway in Congress to bypass the agency. Earlier this year, Rep. Collin Peterson (D-MN) introduced a measure to amend the Federal Food, Drug, and Cosmetic Act and allow hemp-derived cannabinoids (including CBD) in food products. However, given the outbreak of COVID-19 and the slowed legislative pace during a presidential election year, little movement was expected on the bill. Nevertheless, investors and producers aimed to remain bullish toward the regulatory future for CBD.

With the industry continuing to build over uncertain regulatory ground, the FDA's final rulings on CBD-infused foods will be a critical determinant of the CBD market's growth trajectory.

USDA PLANS

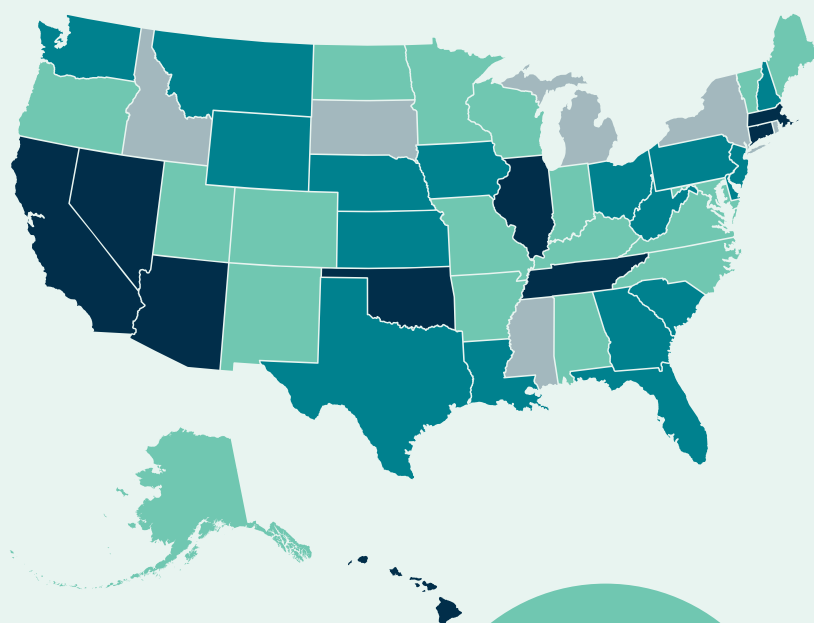
The 2018 Farm Bill placed jurisdiction over hemp cultivation squarely in the hands of the U.S. Department of Agriculture (USDA), which released its interim hemp rules in October 2019. The original rules were controversial among hemp industry operators. Least popular were requirements that farmers must test their crops for THC potency 15 days before harvest at a Drug Enforcement Administration (DEA)-certified facility. Any crops testing above the 0.3% legal threshold for the psychoactive compound would require farmers to use a DEA-approved reverse distributor to dispose of the crops.

The rules not only significantly complicated a grower's production process, but fueled concerns regarding the limited number of DEA-certified

labs in the country. The USDA has since agreed to waive both of those requirements for the 2020 growing season, though it remains unclear whether they will be in play in 2021.

The interim rules also require each state to develop its own hemp rules, which can vary significantly between states. Nevertheless, the USDA's late announcement of the requirements, combined with most hemp farmers' inexperience, has convinced many states to

SUBMISSION & APPROVAL STATUS FOR STATE HEMP PRODUCTION PLANS*



■ Approved 2018 plans

■ States remaining on 2014 pilot program

■ Other in development or under review

18
States

Remain on 2014 pilot program vs. joining the 2018 program

* As of April 16, 2020

Source: New Frontier Data



continue operating under the original 2014 Farm Bill's pilot program rules for the 2020 growing season. As of June 2020, 18 states were opting to remain under the pilot program rules, with the rest developing their own regulatory frameworks.

The development of USDA-approved state hemp rules, and specific choices made by legislators regarding THC testing methodology, treatment of "hot" crops (i.e., crops exceeding 0.3% THC), and penalties for negligent farmers will have serious and lasting impacts both on growers' operations, and for the market competitiveness of individual states.

A PATCHWORK OF REGULATIONS

The lack of clarity from federal regulatory agencies, combined with the quickly evolving competitive landscape of the cannabinoid industry, has created a disparate patchwork of CBD regulations around the country. The administrative assortment has led to widespread confusion among legislators, law enforcement, and hemp industry operators about the rules governing CBD production, distribution, and sales. With so many states operating in direct contradiction to federal law, it seems likely that confusion about regulatory variances and ambiguities will persist until more decisive, comprehensive legislative action is taken on a federal level.

3

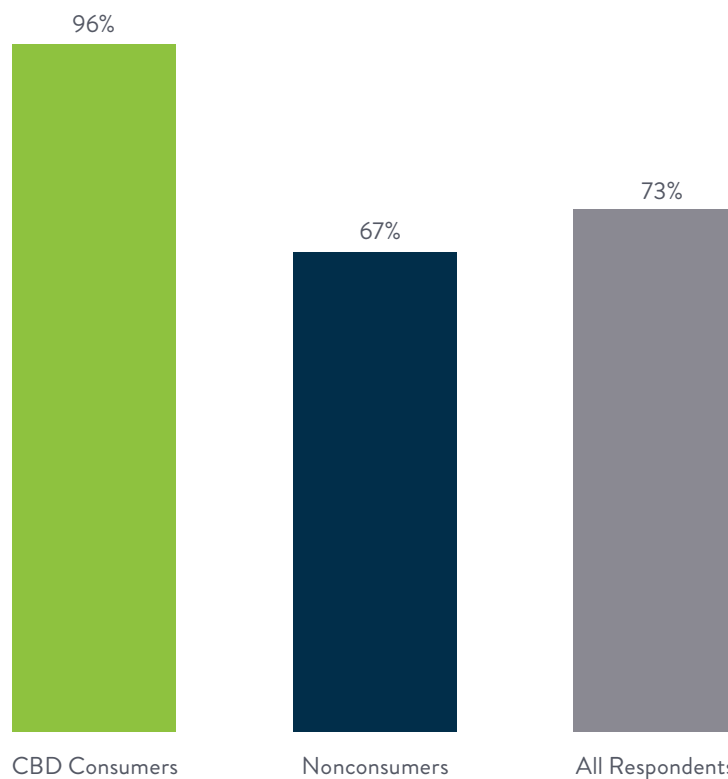
CBD Consumer Behavior & Trends

AMERICANS ARE TALKING ABOUT CBD

New Frontier Data's latest consumer research reveals deepening public interest in and engagement with CBD in the U.S.

Nearly 9 in 10 (86%) of Americans have heard of CBD, 73% of who report having had a conversation about it. Such conversations tend to view CBD in a positive light. More than 3 in 5 (61%) of Americans believe CBD has valid medical uses.

HAVE HAD A CONVERSATION ABOUT CBD



Among those who have heard of CBD.

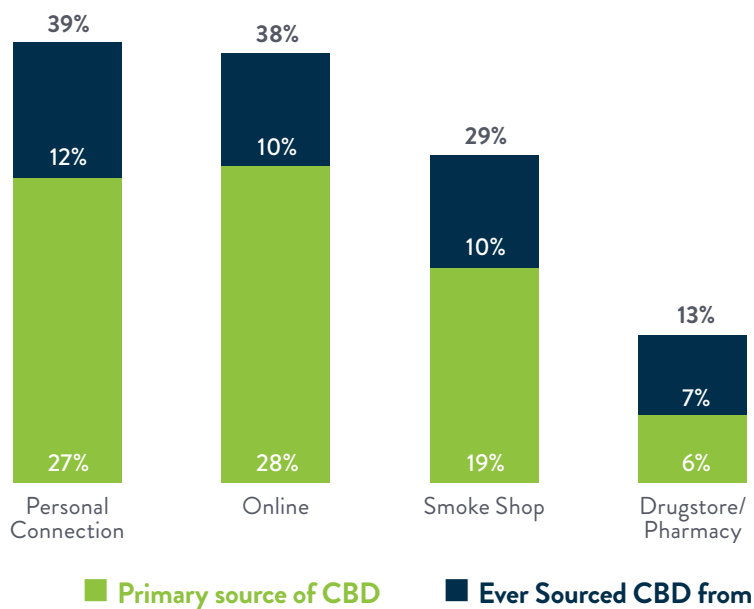
Source: New Frontier Data



SOCIAL INFLUENCES DRIVE CBD ATTITUDES AND BEHAVIORS

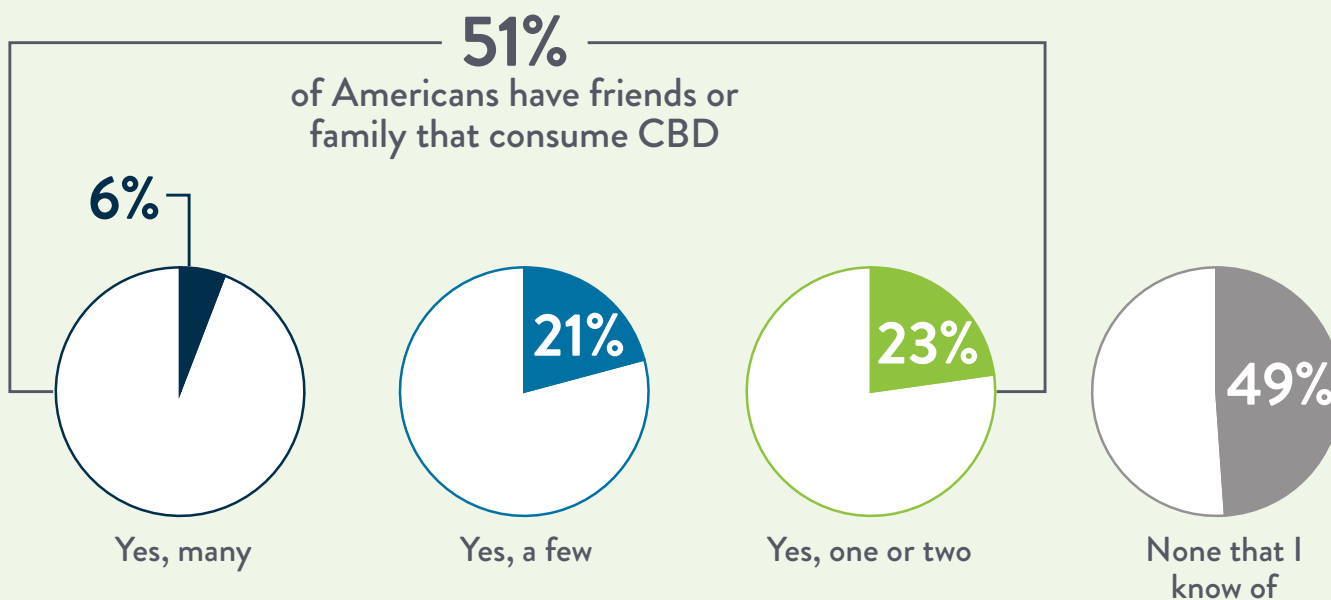
CBD consumers collectively play a major role in shaping their networks' perceptions and uses of the cannabinoid. More than half (56%) of CBD consumers have recommended CBD to someone they know, and nearly as many (54%) take recommendations from friends or family into account when deciding which CBD products to buy. Nearly 2 in 5 (39%) of consumers have ever sourced CBD from a friend or family member, and over one-quarter (27%) of them say that a personal connection remains their primary source of CBD.

FRIENDS & FAMILY ARE LEADING CBD SOURCES AMONG CONSUMERS



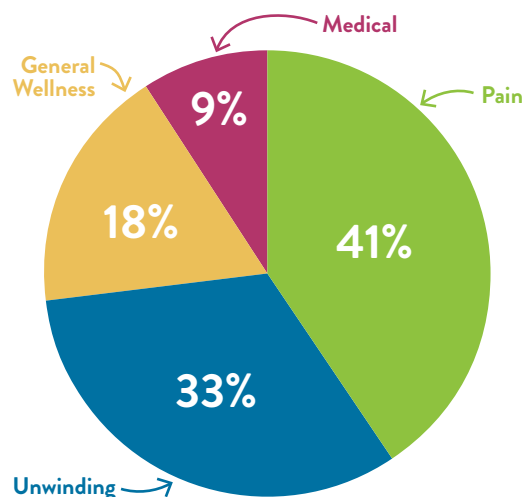
Source: New Frontier Data

DO YOU HAVE FRIENDS OR FAMILY THAT CONSUME CBD?



Source: New Frontier Data



PRIMARY REASON
FOR USING CBD

Among those who have used CBD.

Source: New Frontier Data 2020 U.S. CBD Survey

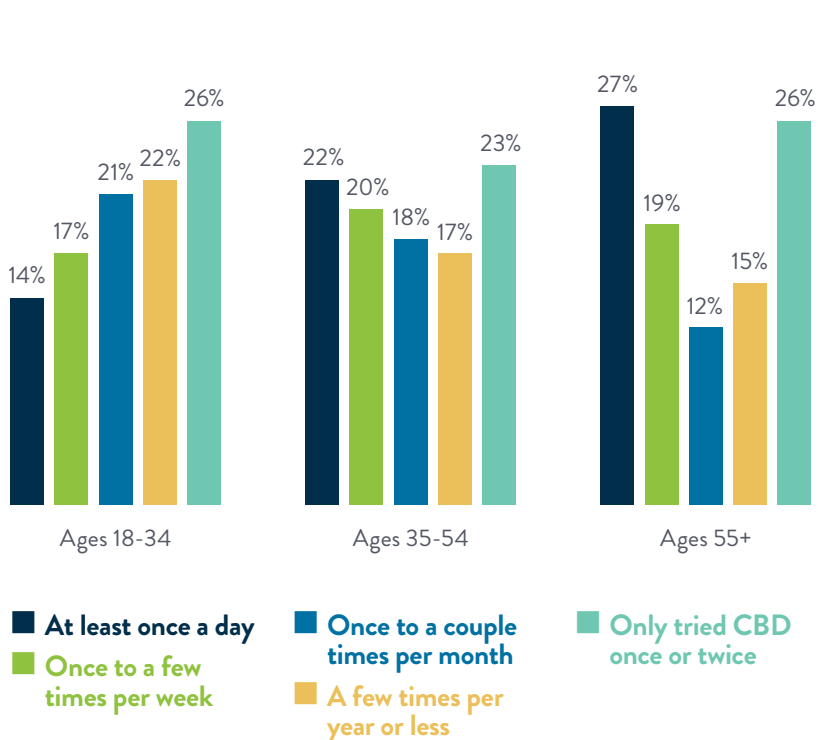
MULTIPLE MOTIVES DRIVE CBD USE

Nearly 1 in 5 (18%) of Americans have consumed CBD. A major reason for such widespread adoption is the diversity of reasons why people use the cannabinoid. The primary reasons cited for CBD use are pain management (41%), unwinding (ranging from relaxation, to relieving stress or anxiety reduction: 33%), promoting general wellness (including aiding sleep and boosting mood: 18%), and medical reasons (treating a condition, managing side effects, or mitigating costs of other medicines: 9%). Overall, most CBD consumers report multiple reasons for using it.

CBD USE AND INTEREST VARY ACROSS AGE

While younger Americans are likelier than older Americans to have tried CBD (23% of 18 to 34-year-olds, and 21% of 35 to 54 year-olds, respectively, versus 14% of those aged 55 and older), and are generally more interested in learning about CBD, older consumers use CBD more frequently than do younger consumers. Those rates indicate that while they are slower to adopt the products, older consumers are more likely to be regimented about their use.

CBD USE FREQUENCY BY AGE

Ever
Used
Form

18-34 35-54 55+

Oil/ Tincture	64%	61%	64%
Topicals	35%	38%	35%
Food	40%	31%	23%
Vape Pen	28%	14%	5%
Pills/ Capsules	16%	16%	13%
Flower	16%	14%	8%
Drinks	16%	13%	2%

Among those who have ever used CBD.

Source: New Frontier Data 2020 U.S. CBD Survey

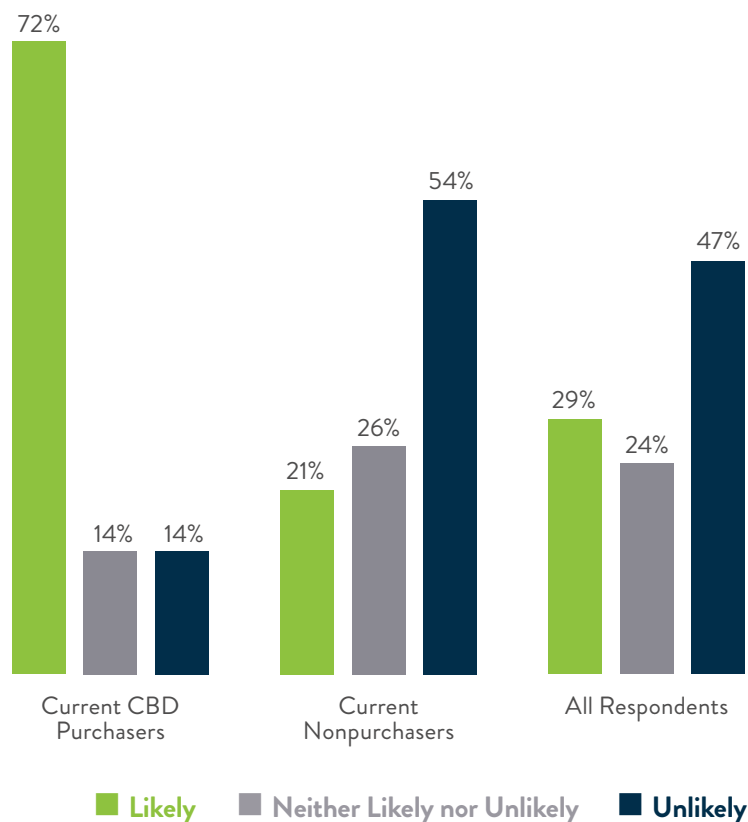


Younger consumers have tried a much broader range of CBD product types (e.g., vape pens, infused foods and drinks), whereas older cohorts are more likely to primarily use CBD oils/tinctures.

HABITS ARE STILL CHANGING

As the American CBD market is young and evolving, consumers' routines and preferences remain unsettled. Among consumers surveyed in late March 2020, more than 4 in 10 (41%) first used CBD in the previous six months, and about 7 in 10 (68%) began consuming it less than a year previously. Three-quarters (75%) of CBD purchasers reported regularly using unfamiliar brands, including 25% of consumers rarely knowing what brands they purchased. While behaviors continue to change, it is clear that Americans remain likely to purchase CBD in the near future: 3 in 10 (29%) of Americans surveyed expected to buy CBD in the following 6 months (including 72% of previous CBD purchasers), along with 21% of those who had not bought CBD before.

LIKELIHOOD OF PURCHASING CBD IN THE NEXT 6 MONTHS



Source: New Frontier Data 2020 U.S. CBD Survey

4 Business Environment

COVID-19'S IMPACT ON CAPITAL MARKETS AND THE BUSINESS ENVIRONMENT

The COVID-19 pandemic has acutely impacted hemp capital markets. The WeedEx stock index – which covers U.S. publicly traded companies in the cannabis industry – has lost nearly a third (32%) of its value since February.

Facing a bear market and the threat of a global recession, companies are finding it increasingly harder to raise and borrow capital.

The capital-intensive nature of cannabinoid processing is particularly threatened, as companies who have taken on significant long-term debt to grow and gain market share must now quickly find a way to become profitable, or risk insolvency.

Further, sustained business shutdowns due to state pandemic containment measures have meant that businesses have been unable to finalize facility buildouts or operate at maximum capacity, and have faced supply-chain disruptions further impacting their ability to generate revenue during a critical period of growth.



PROMINENT BANKRUPTCIES AND WHY THEY ARE HAPPENING

Even before the COVID-19-driven market shock, the cannabinoid industry had been especially turbulent, with industry leaders such as GenCanna Global filing for Chapter 11 bankruptcy, citing the dramatic decline in wholesale prices which made their business models inviable. Prices for raw CBD biomass dropped as much as 83% from 2015 to 2020, while total hemp acreage more than doubled to reach 138,000 acres. The dramatic increase in supply has acutely raised the risk for companies whose growth strategy relied on high CBD prices.

Billions of dollars in private capital have poured into the hemp-derived cannabinoid industry in the past few years, based largely on the expectation of sustained double-digit growth in consumer demand. In the face of a global pandemic and record levels of unemployment, those expectations are now in doubt. As the market matures, price-based competition will become more acute, further straining over-leveraged companies as large brands vie for market share.

MINOR CANNABINOIDS

With hundreds of new companies rushing into the CBD space, many in the industry are looking beyond CBD towards other minor cannabinoids. Like CBD, minor cannabinoids are nonpsychoactive, and purported to reduce inflammation, promote better sleep, and be useful in pain management. For farmers feeling the effects of CBD oversupply, minor cannabinoids can offer higher prices and less regulatory oversight.

Of the 118 minor cannabinoids present in cannabis, the two that have received the most attention from the industry are cannabitol (CBN) and cannabigerol (CBG). Unlike CBD and THC, minor cannabinoids are not under international drug schedules, and are not considered controlled substances in the USA.

Among additional minor cannabinoids currently available are: cannabichromene (CBC), cannabidivarin (CBDV), cannabichrovarin (CBCV), and cannabigerovarin (CBGV) in legally compliant hemp, and tetrahydrocannabivarin (THCV) on the high-THC side of the market.

Many industry operators find minor cannabinoids particularly compelling as they represent an untapped medical arsenal, with early research suggesting minor cannabinoids to have as much if not more potential in nutrition and wellness as THC and CBD. Recent scientific research has indicated that both cannabinoids and terpenes may be able to be used as antiviral drugs. CBG may play a role in controlling or reducing proliferation of cancer, pain, nausea, and inflammation.

CBC, which is reported to be nonpsychoactive, may play roles in neurogenesis, and seems to have many of the same properties as CBD in regards to reducing or controlling inflammation, and in potentially battling cancer.

Though CBDV, discovered in 1969, was among the first identified cannabinoids, its commercialization has been slow. CBDV has been linked to alleviating many conditions, including epilepsy and muscular dystrophy.

Last but not least is THCV, nicknamed the “diet cannabinoid”. Beyond potentially curbing one’s appetite, THCV has been linked with promise in treating both Alzheimer’s and Parkinson’s diseases.

Those are but a short list of minor cannabinoids which have been investigated. There remain many other cannabinoids for which there is no available data toward potential medical or wellness utility. However, given the compelling promise shown by the few can-



nabinoids investigated to date, the potential for further discoveries of medically impactful cannabinoids seems immense.

Despite the market potential for minor cannabinoids, there remain major challenges to their production, or public awareness about them. As no genetics have yet been bred for minor cannabinoids, the relatively low concentration found in most hemp cultivars means that it can take thousands of pounds of biomass to produce even small amounts of the respective compounds, leading to sky-high prices. Alternatively, legally compliant hemp cultivars that do produce augmented amounts of minor cannabinoids (i.e., CBG, cannabichromene [CBC], or cannabidivarin [CBDV]), command premium prices over CBD-producing cultivars, at least for the time being. There is also an acute lack of awareness about their very existence: While nearly 90% of Americans have heard of CBD, but 6.3% have heard of CBN (peaking at 10% among CBD users) and only 3.3% have heard of CBG (or 6.5% of CBD users).

Scant familiarity with the minor cannabinoids underscores how, even as companies develop novel applications for the lesser-known compounds, there will need to be a significant education effort to raise public awareness about how such cannabinoids may be integrated into their lives.

5 What to Look out For?

Searching for Terroir-Appropriate Genetics Increases Risk for Growers, Drives Imperative for Cultivation Best Practices

It will take years before regional cultivars of hemp are fully developed and climatized. In the interim, the risk will be on farmers to test different cultivars for their microclimate as they work to maximize yields and minimize the risks for testing hot. With the full legal liabilities about testing remaining unclear for farmers, hemp operators should take great care to ensure that they are getting the best genetics available, and that they follow best cultivation practices to reduce the likelihood of testing above the legal threshold.

Amid Falling Prices, Plan for Where Prices are Going, Not Where they Currently Are

Many states have received significantly more grower applications than processor applications. That dynamic leads to worries that more biomass will be grown than can be processed, adding further downward price pressure on wholesale prices. While retail consumer demand is growing, with consumers showing interest in using CBD for a range of health and wellness applications, lack of scalable processing capacity will be a key impediment to the industry's ability to capture the rising consumer demand.

While long-term growth opportunities for hemp biomass processing are considerable, it is imperative that companies building processing capacity plan for where the industry is going, not where it currently is. Most bankruptcies by processors to date have been due to unrealistic expectations about how high prices remained even as cultivation capacity increased dramatically. Operating models which account for sustained downward price pressure as the market expands and becomes more efficient will be far better positioned to survive the industry's continuing evolution.



Chances for Clarification of Federal Regulations Unlikely in 2020

In the midst of a global pandemic, mass unemployment, civil unrest, and an upcoming presidential election, it is unlikely that the federal government will make a priority of cannabinoid regulations. It is therefore likely that the hemp-derived cannabinoid industry's current regulatory ambiguity will continue through to the 2021 legislative cycle.

In the interim, operators should build flexibility into their systems to allow for agile adaptation to the final regulations once they are codified.

Industry Growth Will Lead to Greater Standardization, Commoditization, and Transparency

As the industry matures, the development of industry standards and best practices will continue. Standardization is emerging in the areas of purchasing agreements between farmers and processors, extraction processes, and infusion technology, respectively. Such practices should improve the consistency of products, and the ease of doing business while decreasing price risk for farmers and processors alike.

Further, as technology becomes more widely deployed across the sector, greater transparency between wholesale buyers and sellers will reduce risk and increase price stabilization, making it easier for stakeholders across the supply chain to budget and make plans as the industry grows.

Diverse Reasons for Use Creates Widespread Opportunities for Specialized Product Development

With consumers using CBD for a wide range of applications (e.g., from pain management to improving general wellness outcomes), opportunities exist for companies to build products targeted for specific applications rather than any one-sized-fits-all approach. As the market becomes more competitive, brands that identify specific consumer groups and develop products and brands targeting unique applications are more likely to weather the competitive storm than are those trying to serve a general, undefined consumer base. As with most mature consumer product sectors, specialization and data-driven targeting are key sources for competitive differentiation. While the hemp sector has not yet reached such a level of maturation, operators must begin planning for how they will set themselves apart in an increasingly competitive field.



NEW FRONTIER DATA

HEADQUARTERS

1400 I Street NW / Suite 350 / Washington, DC 20005

SALES & MARKETING

535 16th Street / Suite 620 / Denver, CO 80202

LONDON

Smith Building / 179 Great Portland Street / London W1W 5PL

✉ info@NewFrontierData.com ☎ 844-420-D8TA

@NewFrontierData



NewFrontierData.com

InterCannAlliance.com

HempBizJournal.com



Strength in Knowledge®