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Menu

- Home (<https://www.cleanroomtechnology.com/>)
 - Finance (<https://www.cleanroomtechnology.com/Category/Finance>)
 - Microbiology (<https://www.cleanroomtechnology.com/Category/Microbiology>)
 - Containment (<https://www.cleanroomtechnology.com/Category/Containment>)
 - Cleaning (<https://www.cleanroomtechnology.com/Category/Cleaning>)
 - Clothing (<https://www.cleanroomtechnology.com/Category/Clothing>)
 - Monitoring (<https://www.cleanroomtechnology.com/Category/Monitoring>)
 - Regulatory (<https://www.cleanroomtechnology.com/Category/Regulatory>)
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- Pharmaceuticals (<https://www.cleanroomtechnology.com/Category/Pharmaceuticals>)
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- Events (https://www.cleanroomtechnology.com/events/events_page)
- Directory (https://www.cleanroomtechnology.com/Company/list_main)

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Research: Commercial cannabidiol on the UK market is illegal

By Murielle Gonzalez 19-Sep-2019

[Food \(/Category/food\)](#) | [Regulatory \(/Category/Regulatory\)](#)

Consumer products are contaminated with impurities, exceed legal limits of psychoactive cannabinoids and CBD content labelling is inaccurate, independent analysis has revealed



TTS Pharma, a producer of cannabinoids, including cannabidiol CBD, has released the results of independent analyses of its CBD oil for use in food, cosmetics and nutraceuticals. The company engaged Fera Science, a public-private analytical laboratory, to undertake a series of in-depth analytical tests to ensure that its product fully complies with all regulatory requirements. TTS Pharma also requested analyses of a range of other CBD products currently available on the UK market.

THC and CBN are two psychoactive cannabinoids found in cannabis. The Fera analysis showed that TTS Pharma's CBD oil is within the THC and CBN limits of detection (<0.0001%) and confirms that the isolate is exempt from the Misuse of Drugs Regulations (UK Government 2001).

"We are committed to creating the purest CBD oils and isolates, setting standards over and above current regulation to raise the bar in CBD product production," he said.

Speaking at a press conference in London, Mark Tucker, TTS Pharma CEO, explained that as the hemp plant — the source of CBD — naturally absorbs contaminants from soil, water and air (phytoremediation), commercially available CBD may also contain a variety of these harmful impurities.

We are committed to creating the purest CBD oils and isolates, setting standards over and above current regulation

Tucker said the company applies pharmaceutical standards to produce the highest quality, legal, fully licensed cannabidiol (CBD) for use in food, cosmetics and nutraceuticals. To achieve that, TTS Pharma uses the CHOtrak, a fully traceable supply chain system that employs in-line production controls to establish provenance throughout the supply chain.

Target substance	Detected	Not detected	Limit of detection	Acceptable limits (where available)
Controlled cannabinoids	None	Cannabinol 9-Tetrahydrocannabinol 9-Tetrahydrocannabinolic acid	<0.0001% w/w <0.0001% w/w <0.0001% w/w	
Non-controlled cannabinoids	Cannabidiol 9.02 %	Cannabidiolic acid Cannabichromene Cannabigerol	<0.04% w/w <0.04% w/w <0.04% w/w	
Heavy metals	None	Arsenic Cadmium Lead Mercury	<0.01 mg/kg <0.01 mg/kg <0.01 mg/kg <0.01 mg/kg	Daily dose 15 µg/day ^a 1mg/kg 0.1mg/kg 0.1mg/kg ^b
Mycotoxins	None	Aflatoxin B 1 Aflatoxin B 2 Aflatoxin G 1 Aflatoxin G 2	<0.2 µg/kg <0.2 µg/kg <0.2 µg/kg <0.2 µg/kg	
Polycyclic Aromatic Hydrocarbons	Benzo[a]pyrene 0.21 µg/kg PAH4 1.00 µg/kg ^c			2µg/kg 10µg/kg ^d
Dioxins/Furans and Polychlorinated Biphenyls (PCBs)	Sum of Dioxins/Furans TEQ 0.01 ng/kg ^e Sum of Dioxins/Furans/Dioxin-like PCBs) TEQ 0.05 ng/kg			0.75 ng/kg 1.25 ng/kg ^f

Reference list

^a USP <2232> Elemental Contaminants In Dietary Supplements

^b Commission Regulation (EC) No 1881/2006

^c PAH4 is the sum of benzo[a]pyrene, benzo[a]anthracene, benzo[a]fluoranthene and chrysene

^d Commission Regulation (EU) 2015/1933

^e TEQ is the toxic equivalency relative to 2,3,7,8-tetrachloro-p-dioxin, World Health Organization, 2005

^f No acceptable limits are available for food supplements – levels stated are from Commission Regulation (EU) 2015/1933 'food oils and fats'.

Market research

TTS Pharma requested Fera a simultaneous analysis of 31 CBD consumer products currently available on the UK high street, and data revealed products contained illegal levels of THC and CBN and harmful environmental impurities, and inaccurate labelling of CBD content, as seen below in Table 1 and Table 2.

Of the samples tested, the results revealed:

- Inaccurate labelling of CBD content
- CBN and/or THC were found in almost half of the samples (13, 41%), most of which were above the legal limit
- All ten samples found to contain THC were above the 1mg legal limit
- Nine of the thirteen samples contained CBN
- Four of the nine samples which contained CBN were above the 1mg legal limit
- Less than half (thirteen of the samples tested) were within 10% of the stated level of CBD
- Four samples contained less than 50% of the level stated, and five exceeded the level stated

Results: CBN, THC and THC-A content

Thirteen of the samples analysed contained either CBN or THC, or a combination of both. One of the thirteen samples (99368) contained CBN, THC and THC-A. Table 1 shows the amount of CBN and THC, where detected in those thirteen samples, expressed as 'mg per product'.

Table1

Fera sample code	CBN content (mg per product)	THC content (mg per product)
99339	0.7	2.6
99340	N/A	1.9
99354	0.8	6.5
99358	N/A	14.6
99360	3.0	23.8
99363	2.6	12.4
99365	N/A	2.2
99366	1.9	N/A
99368	0.9	3.3
99369	0.4	5.2
99370	2.4	N/A
99371	N/A	3.9
99432	0.5	N/A

Further analysis of three of the UK's top-selling CBD products showed presence of some toxic substances: terpenes, heavy metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs/dioxins) and polychlorinated dibenzofurans (PCDFs/furans).

These substances may have significant health implications including cancer, liver and kidney damage and neurological toxicity.

TTS Pharma CBD oil was shown to be free of all of these impurities. However, the three popular available products tested were shown to contain some or all of these impurities.

Table 2 shows the indicated CBD content of all 31 samples tested. The indicated values are reported as a ‘% weight/weight’ value whereas the declared values are as a ‘% weight/volume’ (this is assumed where the label only states a ‘%’ value). This will have an effect on the difference in indicative versus declared as it does not take into account the density of the samples. Again, assuming a nominal density of 0.9 g/mL for oils, the indicative values will be 90% lower than the declared content.

Table 2

Fera sample code	Indicative CBD content (% w/w)	Label declared ¹ CBD content (% w/v)	Percentage of declared
99339	4.30	5	86
99340	0.25	5	5
99342	2.63	2.5	105
99343	0.93	0.83	112
99344	1.06	1	106
99345	0.15	0.67	23
99346	1.78	1.67	107
99347	0.003	5	0.06
99349	2.60	2.5	104

¹ The label declared content shown in Table 2 as a percent is either taken directly from the label, where shown, or by converting the mg concentration to a percentage from the volume of product

All three of our independent analyses demonstrate an urgent need for greater regulatory control of currently available CBD products to safeguard consumers

“All three of our independent analyses demonstrate an urgent need for greater regulatory control of currently available CBD products to safeguard consumers from making product choices which ultimately may be risking their health,” Tucker said.

For Tucker, the implications of such a rapidly growing market, being flooded with illegal products, cannot be ignored. “Without a detailed analysis of CBD products, by manufacturers and suppliers, consumers cannot be sure whether the product is safe to consume,” he added.



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In light of these results, TTS Pharma claims it is the only UK company able to offer quality assurance from seed to shelf, with detailed product traceability plus product liability insurance as an integral part of its product offering.

Companies

- TTS Pharma Limited (https://www.cleanroomtechnology.com/company/single_company/TTS_Pharma_Limited)

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