

## Proving product quality with HPLC

*Shimadzu's Cannabis Analyzer helps leading supplier of food supplements enhance quality assurance*

BRITISH CANNABIS® was founded in 2018 on the back of rising interest in cannabis products in the UK. To stand out from the crowd in this competitive market, it needed to be able to demonstrate the quality of its products – and so turned to Shimadzu's HPLC Cannabis Analyzer. Dr David Barden tells their story and explains how Shimadzu's technical assistance has contributed to their success.

### High-quality cannabis oils

In recent years, there's been a wave of interest in cannabis-based products – and in particular the oils that can be obtained from the plants. Although these extracts have gained most attention for the medical treatment of epilepsy, there's also a big market for food supplements that aim to help people with their general wellbeing – including anxiety, sleep problems and chronic pain.

But because this sector is currently unregulated, many companies have little or no quality assurance – which is where the founders of BRITISH CANNABIS® spotted an opportunity. By being willing to provide chromatographic evidence about the constituents of their cannabis oils, they've been able to meet the requirements of pharmacists, and so in a short space of time have become the UK's best-selling brand of these supplements.



BRITISH CANNABIS © produces oils containing precisely defined amounts of cannabidiol as the key active component

### Precise quantitation of cannabinoids

The quality-assurance process at BRITISH CANNABIS® starts at the source – the plants themselves. These are grown at the company's farms at sites across Europe, and then shipped to its factory in the South-East of England, where ethanol is used to extract 'full-spectrum' oils containing a suite of cannabinoids, amongst them the key active compound cannabidiol (CBD).

In a marketplace where the constituents of many supplements are shrouded in uncertainty, putting precise figures on the quantities of cannabinoids present in these oils is a key differentiator. “Being able to demonstrate confidence in our data has gained us a lot of business”, says the Head of Scientific Research & Development.

But getting this data wasn't always easy. They previously used to employ GC-FID to analyse their samples, but the high inlet temperatures caused some carboxylate-containing cannabinoids to decompose, rendering the method unreliable. An alternative approach involving derivatization of the carboxylate groups followed by GC-MS might have worked but was beset by co-elution issues.

They therefore turned to HPLC, but to keep a close eye on the rigor of the analysis, they were keen to acquire their own instrument rather than go down the outsourcing route. They were already aware that Shimadzu was a key player in analytical technologies for cannabis in the United States, and so were delighted to find that they had a strong UK operation too.

### **Focused and effective training**



Shimadzu's Cannabis Analyser is a key player in helping BRITISH CANNABIS © to demonstrate the quality of their products.

Right from the initial call, BRITISH CANNABIS® had a great experience with Shimadzu. With limited in-house experience of HPLC, staff at the company needed an all-in-one package of equipment and advice to get them off to a flying start – and Shimadzu's Cannabis Analyzer provided exactly that.

Not only did the sales team show them the sort of results they could expect, but they even worked out the running costs, making it far easier to make the case for investing in the equipment.

In April 2019, with the equipment installed in the lab, a detailed two-day training session from Shimadzu covered everything they needed to know. Following an explanation of the instrument's operation, they were shown how to analyse samples, and were soon running them unaided. The effectiveness of the whole process is concisely conveyed by the analytical team at BRITISH CANNABIS®: "At the end of the training, our team felt like experts!".

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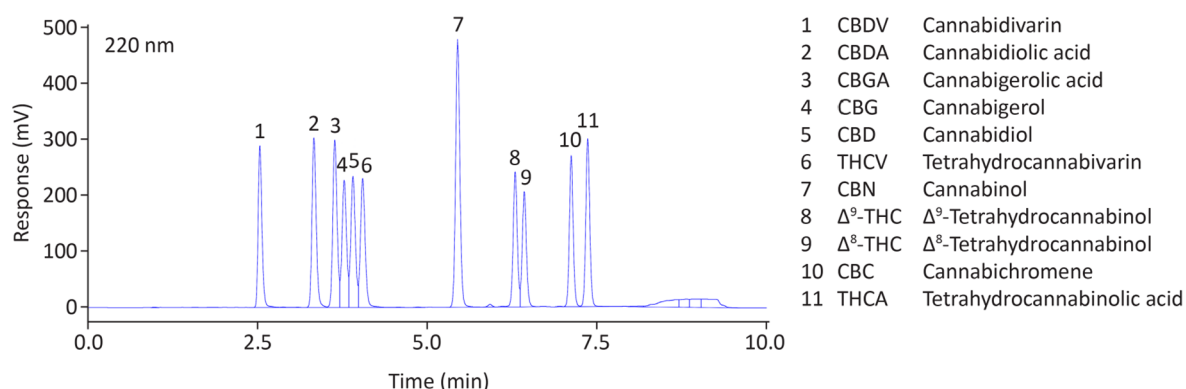
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### **Reliably high performance**

Since then, the Shimadzu equipment used by BRITISH CANNABIS® has become central to the quality-assurance operation for their oils. The company says that as well as assessing levels of the main active component CBD, they also monitor ten other cannabinoids. One of these is the psychoactive chemical  $\Delta$ 9-tetrahydrocannabinol (THC), of which only trace amounts are acceptable in cannabis food supplements. Although the strains of industrial-grade hemp used by the company do not contain THC, it's still useful to monitor for this.

The Head of Scientific Research & Development explains their thinking: "Unlike our competitors, we can be confident that we comply with guidelines about THC, and that the CBD content of our oils is exactly what we say on the label. Being able to rely on our own results generated in-house using validated analytical procedures gives us the confidence to go out into the marketplace and talk about the quality of our products. Other suppliers simply can't do that".

That confidence comes from the reliably high performance of the instrument. In particular, the high degree of separation means that they have very little problem from peak overlap, while the detection range is exactly what they need – they can quantify CBD in diluted samples across the whole calibration range from 0.5 ppm to 90.9 ppm.



*The performance of the HPLC system at BRITISH CANNABIS® is amply demonstrated by this analysis of an 11-component 90.9 ppm standard. Note the good peak separation and the run time of less than 10 minutes.*

### Robust and easy to use

The Cannabis Analyzer can also easily cope with the sample throughput. The Head of Scientific Research & Development says that on a typical day, they'll run about 10 to 15 samples, meaning that there's plenty of room to expand their operation. "We've no doubt that our Shimadzu instrument will be helping us for some time to come, as our business gets bigger", he says.

From a practical perspective, the staff at BRITISH CANNABIS® have also been really pleased with their system. As well as its robust operation and the minimal requirement for solvent, the software is also easy to use: the 'plug and play' operation, the ease of sample selection, and the automatic generation of lab reports are big plus points. The company says that it's features like these that help make everyday operation trouble-free, especially for new employees who might not have an analytical chemistry background.

### Outstanding service

But one advantage of partnering with Shimadzu stands head-and-shoulders above everything else – the quality of the service.

The Head of Scientific Research & Development says: "Working with the Shimadzu team has been fantastic! Right from the outset, they've been reliable, efficient and trustworthy, and any problems we confront are dealt with in a timely manner and with a friendly attitude. The team didn't have much HPLC experience before the installation, so it's been great to be able to rely on them for any questions we might have".

"It stands as testament to both the reliability of the instrument and the quality of the service that, in nine months of using our system, we've only run into two problems, and thanks to Shimadzu's prompt response, both issues were resolved on the same day!".

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*"The level of service we get from Shimadzu is beyond anything we'd expect from other instrument companies – we could not recommend a better team to work with"*

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In summary, Shimadzu has been more like a partner than an equipment supplier – providing staff at BRITISH CANNABIS® with equipment and advice that helps them to prove the quality of their products and so grow their company.

The Head of Scientific Research & Development concludes: "As demand for our products continues to grow rapidly, it's fantastic to have access to such a supportive team – there's little doubt that Shimadzu has played a big role in helping us to take the next step as a business."