

Homogenizing Confectionery Treats Using the Bead Ruptor 96

Protocol Snapshot

Summary

Confectionery treats containing cannabis (commonly known as “edibles”) are cannabinoid infused consumable products employed for recreational and medicinal purposes as an alternative method of cannabinoid delivery that is growing in popularity. These products often contain various concentrations of two sought after cannabinoids, cannabidiol (CBD) and the psychoactive component of Cannabis sativa, tetrahydrocannabinol (THC). Researchers and regulatory bodies are both very interested in analyzing the working concentrations of THC and CBD and their acidic counterparts, THCA and CBDA, in edibles to provide valuable information on their potential therapeutic effects and the regulatory implications of the biologically active cannabinoid components in these various delivery methods. However, cannabinoids are not the only area of interest when evaluating confectionery treats. Recent research has suggested that contaminants such as heavy metals, pesticides, and microbes or their by-products can be found on many cannabis derived products, which may have implications on their safety or efficacy.

An important initial step in any type of chemical or molecular analysis of cannabis containing products, such as edibles, is complete and uniform homogenization. Confectionery treats come in many varieties resulting in a wide range of toughness, and strength, from chocolates and gummies to brownies and cookies. Laboratories are using an assortment of homogenization methods for their cannabinoid-containing samples, many of which fall short in producing a truly uniform homogenate for accurate analysis, resulting in inaccurate data on the cannabinoid content of a given sample. The Omni Bead Ruptor 96 provides homogenization efficiency and effectiveness with robustly reproducible results. The BR96 is capable of processing up to 96 g of edibles across eight 50 mL tubes in less than 6 minutes, providing a homogenate that is suitable for accurate downstream analysis via HPLC-UV, LC-MS/MS, and GC-MS methodologies. In this protocol snapshot, confectionery treats were homogenized to provide an analog to cannabis-containing edibles, showing the processing power of the BR96 in complete preparation of these materials for further chemical and molecular analysis.

Materials and Methods

- Bead Ruptor 96 (Cat No. 27-0001)
with
- 50 mL tubes pre-filled with Hard Tissue Homogenizing Mix (2.8 mm ceramic beads) (Cat No. 19-6508)
- 50 mL Tube Holders (Cat No. 27-1003)



50 mL Tube Carriage



Bead Ruptor 96



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Procedure

Confectionery treats of varying consistencies were homogenized using the BR96 within 50 mL tubes containing 2.8 mm inert ceramic bead media. A summary of sample type, sample weight and sample preparation are outlined in Table 1. All samples were homogenized in 30 mL of methanol acting as a diluent. Due to the larger size of the samples used in this protocol, samples were required to be broken into smaller pieces in order to fit inside of the 50 mL tube for homogenization on the BR96. The samples that were broken to be placed inside the processing tube were not divided in any specific manner, they were manually randomly broken apart into pieces small enough to fit into each tube while maintaining the same starting weight.

Sample Type	Sample Weight	Diluent, Volume	OMNI Bead Kit PN	Speed (Hz)	Time (s)	Cycles	Dwell Time (s)
Brownie	12.4 g	Methanol, 30 mL	19-6508	25	60	2	10
Chocolate Chip Cookie	12.4 g	Methanol, 30 mL	19-6508	25	60	2	10
Raspberry Dark Chocolate Bar	11.7 g	Methanol, 30 mL	19-6508	25	60	2	10
Chocolate Bar with Caramel Inclusions	8.50 g	Methanol, 30 mL	19-6508	25	60	2	10
White Chocolate Ball	12.0 g	Methanol, 30 mL	19-6508	25	60	2	10
Milk Chocolate Ball	12.0 g	Methanol, 30 mL	19-6508	25	60	2	10
Dark Chocolate Ball	12.1 g	Methanol, 30 mL	19-6508	25	60	2	10
Chocolate Ball with Caramel Inclusions	11.9 g	Methanol, 30 mL	19-6508	25	60	2	10
Gummy Bears	9.20 g	Methanol, 30 mL	19-6508	25	60	5	10

Table 1. Sample Homogenization Summary for All Samples

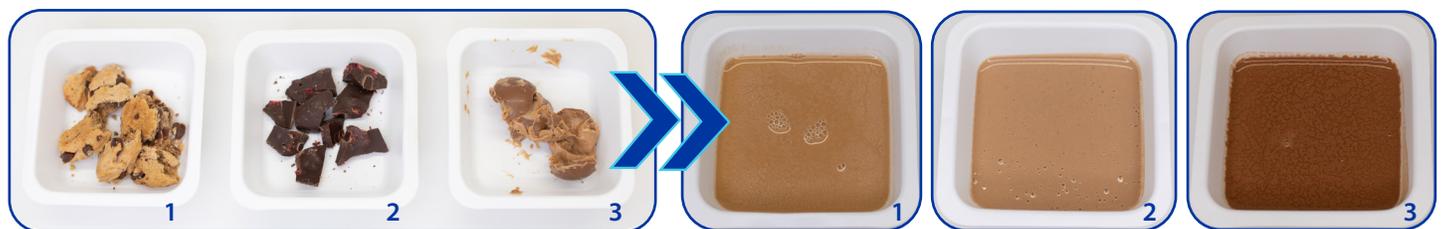


Figure 1. Chocolate Chip Cookie ¹, Raspberry Dark Chocolate Bar ² and Chocolate Ball with Caramel Inclusions ³ samples before and after homogenization.

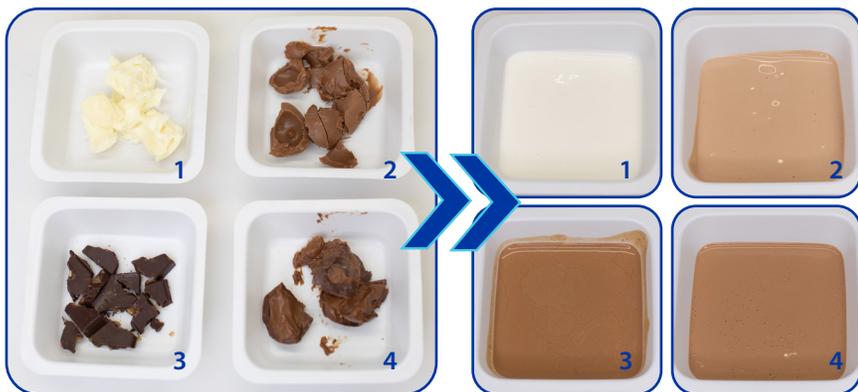


Figure 2. White Chocolate Ball¹, Milk Chocolate Ball², Chocolate Bar with Caramel Inclusions³, and Dark Chocolate Ball⁴ samples before and after homogenization.



Figure 3. Image of Gummy Bear¹, and Brownie² samples before and after homogenization

Conclusion

Confectionery samples, including brownies, cookies, and a variety of chocolates, were completely homogenized using a 50 mL tube format in 30 mL methanol using the Bead Ruptor 96 with ceramic bead kits. As seen in Figures 1-3, a completely uniform liquid homogenate was obtained after 2 minutes of processing on the BR96 at 25 Hz. This short processing time along with increased sample throughput allows for laboratories to expedite their sample preparation time of these cannabinoid containing products ahead of downstream chemical and molecular analysis.

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