Americans For Safe Access What's in Your Cannabis Products?

A Patient's Guide to Understanding Labels and Interpreting Product Certificates of Analysis (CoA)





AMERICANS FOR SAFE ACCESS

A Patient's Guide to Understanding Labels and Interpreting Product Certificates of Analysis

WHAT TO KNOW ABOUT PACKAGING, LABELING, AND HANDLING

Due to a current lack of adequate governmental regulation with regard to hemp-derived CBD products, consumers purchasing CBD products from a source other than a medical cannabis dispensary must be wary of unscrupulous actors and poor production processes. It should also be noted that not all medical cannabis dispensaries are the same. Product safety testing is not required by all states, and patients should be aware of the testing that is done on the products they are consuming.

Unless the producer has appropriate certifications from an independent oversight body (e.g., ASA's Patient Focused Certification), it may be difficult for consumers to ascertain whether the products they wish to purchase are well made and accurately labeled. A 2017 analysis of 84 products from 31 companies found that 43% contained more CBD than was indicated on the label and that 26% contained less CBD than was indicated on the label; additionally, THC was found in 18 out of the 84 samples even though none of the labels indicated that the products contained THC.55

Consumers must pay close attention to how products are packaged, labeled, and stored to ensure product safety and efficacy. Light, heat, and oxygen affect, and can degrade, cannabinoids and terpenes. Excessive moisture in a product can promote spoilage and fungal growth. Generally, cannabis floral material and products derived therefrom should be packaged in a manner that minimizes exposure to these factors and should be stored in a climate-controlled setting to avoid elevated temperatures. To protect the contents within, containers should be rigid, airtight, and made out of a non-absorptive material (e.g., glass, stainless steel) that is appropriate for the type of product in question.

It is important that consumers closely read product labels, which should include all of the following:

- Name and place of business of the manufacturer or distributor;
- Identity of the product;
- Cannabinoid content:
- Net quantity of contents in terms of weight, numerical count, or other appropriate measure;
- A batch, lot, or control number;
- Production date or expiration date (products susceptible to spoilage must bear a "use by" date and/or a "freeze by" date);
- Instructions for use;
- Dosing guidance;
- Appropriate warnings for use, including any individuals for whom the product is contraindicated, as appropriate; and
- Instructions for appropriate storage.

Ingredients, including cannabis ingredients;

- Cannabinoid content;

- Sugars (when greater than 1 g per serving);
- Protein (when greater than 1 g per serving); and
- recommended daily intake).

CONSUMERS SHOULD

CANNABIS-DERIVED

CANNOT OR WILL NOT

NOT PURCHASE

PRODUCTS FROM

COMPANIES THAT

Note that the FDA has sent warning letters to companies that overstate the health effects and benefits of CBD products. Even if there is research indicating that CBD may be efficacious for a given condition, be wary of products that contain labeling statements that over promise or make outrageous claims like "this will cure cancer."

Generally, reputable producers will provide Certificates of Analysis (CoAs) from independent and properly certified testing laboratories for all of their products. CoAs **PROVIDE PRODUCT- AND** show the amount and concentration of major cannabinoids and terpenes present in the tested sample, as well testing data regarding the lack or presence of microbial BATCH-SPECIFIC "CoAs". and fungal contaminants, levels of heavy metals, and measures of pesticide and solvent residues (if applicable).

> Some producers provide CoAs proactively (e.g., provide a link on the product's webpage); others make them available upon request. Consumers should not purchase cannabisderived products from companies that cannot or will not provide product- and batchspecific CoAs.



Edible products should be labeled with content and nutrition information, including:

Total calories and fat calories (when greater than 5 calories per serving);

Total fat, saturated fat, and trans fat (when greater than 0.5 g per serving);

• Cholesterol (when greater than 2 mg per serving);

Sodium (when greater than 5 mg per serving);

Total carbohydrates (when greater than 1 g per serving);

• Dietary fiber (when greater than 1 g per serving);

• Vitamin A, vitamin C, calcium, and iron (when present at greater than 2% of the

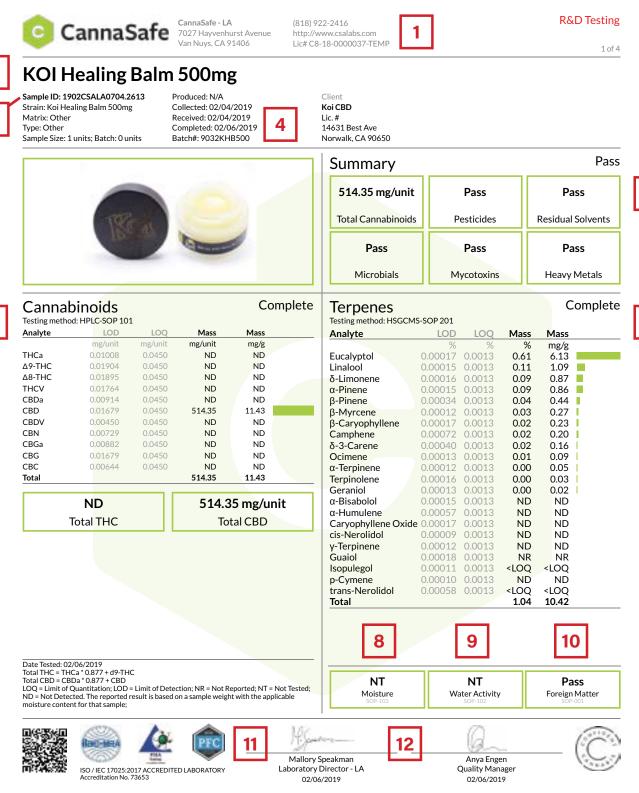
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SAMPLE CERTIFICATE OF ANALYSIS

(Descriptions found on page 28-29)



The values reported pertain only to the product tested. R&D sample only. Tested as-is/received from client. Unless otherwise stated all quality control samples performed within specifications established by the Laboratory. Sample tested per CALIFORNIA CODE OF REGULATIONS, TITLE 16, DIVISION 42. BUREAU OF CANNABIS CONTROL.

Figure 3: Page 1/4 of a Sample Certificate of Analysis⁵⁶

4

c. # 4631 Best Ave orwalk, CA 90650			
Summary		Pass	
514.35 mg/unit	Pass	Pass	5
Total Cannabinoids	Pesticides	Residual Solvents	
Pass	Pass	Pass	
Microbials	Mycotoxins	Heavy Metals	

Terpenes				C	omplete
Testing method: HSGCMS	S-SOP 201				
Analyte	LOD	LOO	Mass	Mass	
	%	%	%	mg/g	
Eucalyptol	0.00017	0.0013	0.61	6.13	
Linalool	0.00015	0.0013	0.11	1.09	
δ-Limonene	0.00016	0.0013	0.09	0.87	
α-Pinene	0.00015	0.0013	0.09	0.86	
β-Pinene	0.00034	0.0013	0.04	0.44	
3-Myrcene	0.00012	0.0013	0.03	0.27	1
β-Caryophyllene	0.00017	0.0013	0.02	0.23	1
Camphene	0.00072	0.0013	0.02	0.20	1
δ-3-Carene	0.00040	0.0013	0.02	0.16	1
Ocimene	0.00013	0.0013	0.01	0.09	1
α-Terpinene	0.00012	0.0013	0.00	0.05	1
Terpinolene	0.00016	0.0013	0.00	0.03	1
Geraniol	0.00013	0.0013	0.00	0.02	1
α-Bisabolol	0.00015	0.0013	ND	ND	
α-Humulene	0.00057	0.0013	ND	ND	
Caryophyllene Oxide	0.00017	0.0013	ND	ND	
cis-Nerolidol	0.00009	0.0013	ND	ND	
y-Terpinene	0.00012	0.0013	ND	ND	
Guaiol	0.00018	0.0013	NR	NR	
Isopulegol	0.00011	0.0013	<loq< td=""><td><loq< td=""><td></td></loq<></td></loq<>	<loq< td=""><td></td></loq<>	
o-Cymene	0.00010	0.0013	ND	ND	
rans-Nerolidol	0.00058	0.0013	<loq< td=""><td><loq< td=""><td></td></loq<></td></loq<>	<loq< td=""><td></td></loq<>	
Total			1.04	10.42	
8	_	9		10	D
NT Moisture SOP-103	Wa	NT ater Activity SOP-102		Pa Foreign	
eakman rector - LA 019]	Anya Enge Quality Man 02/06/201	ager		

😳 CannaSafe	7027 Hayvenhurst Van Nuys, CA 9140
KOI Healing Balr	m 500mg
Sample ID: 1902CSALA0704.2613	Produced: N/A

Sample ID: 1902CSALA0704.2613	Produced: N/A
Strain: Koi Healing Balm 500mg	Collected: 02/04/2019
Matrix: Other	Received: 02/04/2019
Type: Other	Completed: 02/06/2019
Sample Size: 1 units; Batch: 0 units	Batch#: 9032KHB500

CannaSafe - LA

7027 Hayvenhurst Avenue

Van Nuvs, CA 91406

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esticides	
st Method: LCMS & GCM	S-SOP 30

Analyte	LOD	100									
		LOQ	Limit	Mass	Status	Analyte	LOD	LOQ	Limit	Mass	Status
	µg/g	µg/g	µg/g	µg/g			µg/g	µg/g	µg/g	µg/g	
Abamectin	0.0048	0.1	0.3000	ND	Pass	Fludioxonil	0.0005	0.1	30.0000	ND	Pass
Acephate	0.0090	0.1	5.0000	ND	Pass	Hexythiazox	0.0070	0.1	2.0000	ND	Pass
Acequinocyl	0.0050	0.1	4.0000	ND	Pass	Imazalil	0.0040	0.1	0.0040	ND	Pass
Acetamiprid	0.0040	0.1	5.0000	ND	Pass	Imidacloprid	0.0009	0.1	3.0000	ND	Pass
Aldicarb	0.0040	0.1	0.0040	ND	Pass	Kresoxim Methyl	0.0027	0.1	1.0000	ND	Pass
Azoxystrobin	0.0060	0.1	40.0000	ND	Pass	Malathion	0.0006	0.1	5.0000	ND	Pass
Bifenazate	0.0040	0.1	5.0000	ND	Pass	Metalaxyl	0.0008	0.1	15.0000	ND	Pass
Bifenthrin	0.0080	0.1	0.5000	ND	Pass	Methiocarb	0.0060	0.1	0.0060	ND	Pass
Boscalid	0.0007	0.1	10.0000	ND	Pass	Methomyl	0.0008	0.1	0.1000	ND	Pass
Captan	0.0007	0.1	5.0000	ND	Pass	Methyl Parathion	0.0070	0.1	0.0070	ND	Pass
Carbaryl	0.0006	0.1	0.5000	ND	Pass	Mevinphos	0.0030	0.1	0.0030	ND	Pass
Carbofuran	0.0050	0.1	0.0050	ND	Pass	Myclobutanil	0.0036	0.1	9.0000	ND	Pass
Chlorantraniliprole	0.0005	0.1	40.0000	ND	Pass	Naled	0.0036	0.1	0.5000	ND	Pass
Chlordane	0.0319	0.1	0.0319	ND	Pass	Oxamyl	0.0030	0.1	0.2000	ND	Pass
Chlorfenapyr	0.0100	0.1	0.0100	ND	Pass	Paclobutrazol	0.0130	0.1	0.0130	ND	Pass
Chlorpyrifos	0.0050	0.1	0.0050	ND	Pass	Pentachloronitrobenzene	0.0020	0.1	0.2000	ND	Pass
Clofentezine	0.0006	0.1	0.5000	ND	Pass	Permethrin	0.0006	0.1	20.0000	ND	Pass
Coumaphos	0.0090	0.1	0.0090	ND	Pass	Phosmet	0.0070	0.1	0.2000	ND	Pass
Cyfluthrin	0.0008	0.1	1.0000	ND	Pass	Piperonyl Butoxide	0.0013	0.1	8.0000	ND	Pass
Cypermethrin	0.0130	0.1	1.0000	ND	Pass	Prallethrin	0.0070	0.1	0.4000	ND	Pass
Daminozide	0.0210	0.1	0.0210	ND	Pass	Propiconazole	0.0080	0.1	20.0000	ND	Pass
DDVP	0.0040	0.1	0.0040	ND	Pass	Propoxur	0.0040	0.1	0.0040	ND	Pass
Diazinon	0.0006	0.1	0.2000	ND	Pass	Pyrethrins	0.0030	0.1	1.0000	ND	Pass
Dimethoate	0.0030	0.1	0.0030	ND	Pass	Pyridaben	0.0005	0.1	3.0000	ND	Pass
Dimethomorph	0.0007	0.1	20.0000	ND	Pass	Spinetoram	0.0005	0.1	3.0000	ND	Pass
Ethoprophos	0.0040	0.1	0.0040	ND	Pass	Spinosad	0.0050	0.1	3.0000	ND	Pass
Etofenprox	0.0050	0.1	0.0050	ND	Pass	Spiromesifen	0.0008	0.1	12.0000	ND	Pass
Etoxazole	0.0098	0.1	1.5000	ND	Pass	Spirotetramat	0.0090	0.1	13.0000	ND	Pass
Fenhexamid	0.0009	0.1	10.0000	ND	Pass	Spiroxamine	0.0060	0.1	0.0060	ND	Pass
Fenoxycarb	0.0070	0.1	0.0070	ND	Pass	Tebuconazole	0.0024	0.1	2.0000	ND	Pass
Fenpyroximate	0.0008	0.1	2.0000	ND	Pass	Thiacloprid	0.0024	0.1	0.0070	ND	Pass
Fipronil	0.0170	0.1	0.0170	ND	Pass	Thiamethoxam	0.0040	0.1	4.5000	ND	Pass
Flonicamid	0.00170	0.1	2.0000	ND	Pass	Trifloxystrobin	0.0040	0.1	30.0000	ND	Pass

Date Tested: 02/06/2019 LOQ = Limit of Quantitation; LOD = Limit of Detection; NT = Not Tested; ND = Not Detected.



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Figure 4: Page 2/4 of a Sample Certificate of Analysis

(818) 922-2416 http://www.csalabs.com Lic# C8-18-0000037-TEMP **R&D** Testing

2 of 4

Pass

Client Koi CBD Lic.# 14631 Best Ave Norwalk, CA 90650

Mallory Speakman

Laboratory Director - LA 02/06/2019





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R&D Testing

3 of 4

KOI Healing Balm 500mg

Sample ID: 1902CSALA0704.2613 Strain: Koi Healing Balm 500mg	Produced: N/A Collected: 02/04/2019	Client Koi CBD	
Matrix: Other	Received: 02/04/2019	Lic. #	
Type: Other	Completed: 02/06/2019	14631 Best Ave	
Sample Size: 1 units; Batch: 0 units	Batch#: 9032KHB500	Norwalk, CA 90650	

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	-

Residual Solvents Testing method: HSGCMS-SOP 202					Pass
Analyte	LOD	LOQ	Limit	Mass	Status
	µg/g	µg/g	µg/g	µg/g	
1,2-Dichloro-Ethane	0.3	3	1	ND	Pass
Acetone	1.4	14	5000	ND	Pass
Acetonitrile	0.3	2	410	ND	Pass
Benzene	0.1	1	1	ND	Pass
Butane	2.5	25	5000	ND	Pass
Chloroform	0.4	4	1	ND	Pass
Ethanol	1.4	14	5000	ND	Pass
Ethyl-Acetate	1.4	14	5000	ND	Pass
Ethyl-Ether	1.4	14	5000	ND	Pass
Ethylene Oxide	0.3	3	1	ND	Pass
Heptane	1.4	14	5000	ND	Pass
sopropanol	1.4	14	5000	ND	Pass
Methanol	1.8	18	3000	ND	Pass
Methylene-Chloride	0.4	4	1	ND	Pass
n-Hexane	1.7	17	290	ND	Pass
Pentane	1.4	14	5000	ND	Pass
Propane	1.0	10	5000	ND	Pass
Toluene	5.3	53	890	ND	Pass
Trichloroethene	0.5	5	1	ND	Pass
Xylenes	13.0	130	2170	ND	Pass

Date Tested: 02/06/2019 LOQ = Limit of Quantitation; LOD = Limit of Detection; NT = Not Tested; ND = Not Detected.



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Figure 5: Page 3/4 of a Sample Certificate of Analysis



KOI Healing Balm 500mg

Sample ID: 1902CSALA0704.2613
Strain: Koi Healing Balm 500mg
Matrix: Other
Type: Other
Sample Size: 1 units; Batch: 0 units

Received: 02/04/2019 Completed: 02/06/2019 Batch#: 9032KHB500

Produced: N/A Collected: 02/04/2019

Microbials 15 Test method: PCR-SOP 401

Analyte
Aspergillus flavus
Aspergillus fumigatus
Aspergillus niger
Aspergillus terreus
Shiga toxin-producing E. Coli
Salmonella

Date Tested: 02/06/2019 LOQ = Limit of Quantitation; LOD = Limit of Detection; NT = Not Tested; ND = Not Detected.

16	Mycotoxins Test method: LCMS- Analyte	SOP 301	LOD
			µg/kg
	B1		0.001
	B2		0.007
	G1		0.007
	G2		0.006
	Total Aflatoxins		
	Ochratoxin A		0.013

Date Tested: 02/06/2019 LOQ = Limit of Quantitation; LOD = Limit of Detection; NT = Not Tested; ND = Not Detected.;

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Heavy Metals Testing method: ICPMS-SOP 501					Pass
Analyte	LOD	LOQ	Limit	Units	Status
	µg/g	µg/g	µg/g	µg/g	
Arsenic	0.001	0.01	1.5	0.018	Pass
Cadmium	0.001	0.01	0.5	ND	Pass
Lead	0.001	0.01	0.5	0.084	Pass
Mercury	0.001	0.01	3.0	ND	Pass

Date Tested: 02/06/2019 LOQ = Limit of Quantitation; LOD = Limit of Detection; NT = Not Tested; ND = Not Detected.



The values reported pertain only to the product tested. R&D sample only. Tested as-is/received from client. Unless otherwise stated all quality control samples performed within specifications established by the Laboratory. Sample tested per CALIFORNIA CODE OF REGULATIONS, TITLE 16, DIVISION 42. BUREAU OF CANNABIS CONTROL.

Figure 6: Page 4/4 of a Sample Certificate of Analysis

(818) 922-2416	R&D Testing
http://www.csalabs.com Lic# C8-18-0000037-TEMP	4 of 4

Client	
Koi CBD	
Lic. #	
14631 Best Ave	
Norwalk, CA 90650	

	Pass
Result	Status
Not Detected	Pass

			Pass
LOQ	Limit	Units	Status
µg/kg	µg/kg	µg/kg	
0.005		ND	Tested
0.022		ND	Tested
0.022		ND	Tested
0.021		ND	Tested
	20	ND	Pass
0.045	20	ND	Pass

Anya Engen Quality Manager Mallory Speakman Laboratory Director - LA 02/06/2019 02/06/2019

The Sample Certificates of Analysis (pages 24-27) were provided by CannaSafe, a Patient Focused Certification (PFC) and ISO/IEC 17025 accredited laboratory located in Van Nuys, CA, and is reprinted here with permission from their client KOI. Below are some things to take note of that are present:

- 1. The name, address, contact information, and the license # (where applicable) of the testing facility.
 - a. Cannabis testing laboratories are required to be licensed by most states, and in some states, hemp cultivators may send their products for testing to licensed cannabis testing facilities.
- 2. The name of the product and any other identifiers printed on the label (e.g., the amount of CBD in the bottle, in this case 500mg).
 - a. What is printed on the report should match the label with regard to product name, dosage, lot number, batch number, and any other identifiers listed.
- 3. Sample identification number
 - a. This number is used by the laboratory to track the sample. This may include any state-required tracking information, a unique identifier developed by the laboratory, or both.
- 4. The date the product was submitted for testing and the date testing was completed.
 - a. This is important to know to ensure that newly cultivated and manufactured products are being tested and that testing is done in a timely manner upon receipt of the sample.
- 5. Testing Summary
 - a. This summary table shows all the tests that the sample was subjected to and what the outcomes of those tests were. This section is not required on a CoA but is nice to have so that consumers know immediately what standards the product has been tested to and what their outcome was without reading the entire report.
- 6. Cannabinoid Content
 - a. This is also known as the potency of the product. This is where to find information on what cannabinoids have been detected and in what quantity. This is especially important for people to know so that they can determine the exact dose that they are taking in the event it needs to be adjusted. It is also important to know if the consumer does not want a specific cannabinoid, such as THC, in their product.
 - b. For flower products, dosage is typically presented in a percent by weight, e.g., 15% CBD.
 - c. For non-flower products, such as edibles or topicals, dosage information is typically presented in mg/g or mg/mL. Patients may then use this information to determine how much is in a dose that they are taking.
 - d. This CoA also lists the LOD and LOQ. LOD is the Limit of Detection, which is the smallest amount that the instrument can accurately identify. LOQ is the Limit of Quantification, which is the smallest amount that the instrument can accurately quantify.
- 7. Terpene Content
 - a. Terpenes impart flavors and scents to cannabis and contribute to the entourage effect.







- 8. Moisture Content
- not subject to moisture content analysis.
- 9. Water Activity
- 10. Foreign Matter
- cannabis flower and products.
- 11. Accreditations
 - received here.
 - with their respective standards.
- 12. Signature Marks
- 13. Pesticides
- 14. Residual Solvents
- 15. Microbials
- 16. Mycotoxins
- 17. Heavy Metals

a. This is a measurement of the amount of water in a product and is determined by drying the sample. This is typically only done on flower samples.

b. In the case of this product, NT stands for Not Tested. This product is a lip balm and

a. This is a measurement of the amount of free water in a product. This is traditionally a test performed on food products to determine its potential for microbial growth, but can be performed on other product types as well such as flowers and concentrates.

a. This is a test that looks at the amount and type of extraneous material found in

a. This laboratory has chosen to place any accreditations and certifications it has

b. Accreditations and certifications show that the laboratory has undergone review of its quality and operating systems by third-party reviewers to ensure compliance

a. All tests should be reviewed by the laboratory prior to release. This test report has been reviewed and approved by the Laboratory Director and the Quality Manager.

a. This is a test to determine the presence, and quantity, of pesticides. Pesticides are regulated by the Environmental Protection Agency (EPA), and none have been approved for use specifically on cannabis and hemp. Some states have approved certain products or classes or products for use in the cultivation of cannabis and hemp, and some require testing for a range of allowed and prohibited pesticides.

a. Cannabinoids and terpenes are extracted using a number of different methods, some of which may include potentially harmful or toxic solvents such as butane or isopropyl alcohol. This test determines and quantifies the presence of any of those solvents.

a. Microbiological contamination is a test for microbial species such as E. Coli and Salmonella. These contaminants can be quite harmful to people and pets who are exposed to them, particularly those with compromised immune systems.

a. Mycotoxins consist of four aflatoxins (O1, O2, G1, G2) and Ochratoxin A. Ochratoxin A is a known carcinogen and can be dangerous. Aflatoxins are toxic and may cause immunotoxicity, teratogenicity, and hepatotoxicity.57

a. The four heavy metals typically tested for are lead (Pb), cadmium (Cd), mercury (Hg), and arsenic (As). Acute heavy metals poisoning can lead to feeling confused or numb, feeling sick and throwing up, or passing out. Chronic heavy metals poisoning can cause headaches, achy joints and muscles, and constipation.58

Americans for Safe Access

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