

Certificate of Analysis

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 River Falls, WI, 54022
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www.eurofinsus.com/biodiagnostics

Customer Name: Fresh Hemp Foods (Manitoba Harvest USA LLC)
Office: Winnipeg, MB
Street Address: 69 Eagle Drive
City, State, Zip: Winnipeg, Manitoba, R2R 1V4
Phone:

Date Reported: 05/17/2019
Date Completed: 04/09/2019
Date Received: 04/05/2019
Testing Method: HPLC-DAD

Sample Information		Cannabinoid Name	ID	Weight %	Conc. mg/g	Conc. mg/mL
Sample No:	119060853	Cannabichromenic Acid	CBCA	ND	ND	
Crop:	Hemp, Industrial	Cannabicyclol	CBL	0.009	0.09	
Variety:	Hemp Oil	Cannabidiol	CBD	4.030	40.30	
Lot:	C19058	Cannabidiolic Acid	CBDA	0.008	0.08	
Seed Size:		Cannabidivarin	CBDV	0.019	0.19	
Customer Tracking#:		Cannabidivarinic Acid	CBDVA	ND	ND	
Seeds Per Pound:		Cannabigerol	CBG	<LOQ	<LOQ	
Batch:	VGel VG0396	Cannabigerolic Acid	CBGA	ND	ND	
LIMS:		Cannabichromene	CBC	0.012	0.12	
IL:		Cannabinol	CBN	ND	ND	
		Cannabinolic Acid	CBNA	ND	ND	
Comments:	LOQ= 50 ppm or 0.005 wt %	Δ^9 -Tetrahydrocannabinol	Δ^9 -THC	0.005	0.05	
		Δ^8 -Tetrahydrocannabinol	Δ^8 -THC	ND	ND	
		Tetrahydrocannabinolic Acid A	THCA-A	ND	ND	
		Tetrahydrocannabivarin	THCV	ND	ND	
		Tetrahydrocannabivarinic Acid	THCVA	ND	ND	
				Total Cannabinoids	4.084	40.84
				Total THC*	0.005	0.05



*Total THC is calculated as the sum of Δ^9 -THC + Δ^8 -THC + (THCA-A * 0.877) + THCV + (THCV-A * 0.877).

Eurofins BioDiagnostics, Inc. warrants that it uses due care when performing tests for its customers. However, testing results are only reflective of the sample submitted by the customer. Eurofins BioDiagnostics, Inc. does not warrant the sample is representative of the seed lot from which the sample is drawn. Except for the testing services provided, Eurofins BioDiagnostics, Inc. makes no warranties or guarantees of any kind, expressed or implied, with respect to the services rendered.

Joseph Zalusky
 Approved Chemist, Gas Chromatography
 American Oil Chemists' Society (AOCS)



Certificate of Analysis

Eurofins BioDiagnostics, Inc.

Sample Name:	Hemp Oil	Eurofins Sample:	8326162
Project ID	EUROFINS-20190408-0187	Receipt Date	08-Apr-2019
PO Number	CVD	Receipt Condition	Ambient temperature
Sample Serving Size		Login Date	08-Apr-2019
Description	C19058 119060853	Date Started	08-Apr-2019

Analysis	Result
Terpenes *	
(-)-alpha-Bisabolol	61 mg/100g
Camphene	<1.0 mg/100g
(1S)-(+)-3-Carene	<1.0 mg/100g
beta-Caryophyllene	19 mg/100g
p-Cymene	<1.0 mg/100g
Eucalyptol	2.8 mg/100g
alpha-Humulene (alpha-Caryophyllene)	5.7 mg/100g
(-)-Isopulegol	<1.0 mg/100g
(R)-(+)-Limonene	<1.0 mg/100g
Linalool	<1.0 mg/100g
beta-Myrcene	1.3 mg/100g
(E)-b-Ocimene	<0.60 mg/100g
(Z)-b-Ocimene	<0.30 mg/100g
alpha-Pinene	<1.0 mg/100g
beta-Pinene	<1.0 mg/100g
alpha-Terpinene	<1.0 mg/100g
gamma-Terpinene	<1.0 mg/100g
Terpinolene	<1.0 mg/100g
Mycotoxins in Raw Materials	
Aflatoxin B1	<0.500 ppb
Aflatoxin B2	<0.500 ppb
Aflatoxin G1	<0.500 ppb
Aflatoxin G2	<0.500 ppb
Aflatoxin M1	<0.500 ppb
Aflatoxin M2	<0.500 ppb
Deoxynivalenol	<100 ppb
T-2 Toxin	<10.0 ppb
HT-2 Toxin	<100 ppb
Fumonisin B1	<25.0 ppb
Fumonisin B2	<25.0 ppb
Ochratoxin A	<1.00 ppb
Zearalenone	<30.0 ppb

Multi-Residue Analysis for hemp products - 60+ compounds

Matrix Type - To Determine Limit of Quantification (LOQ)

High-Fat Food Matrices

* This analysis or component is not ISO accredited.

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Sample Name:	Hemp Oil	Eurofins Sample:	8326162
Project ID	EUROFINS-20190408-0187	Receipt Date	08-Apr-2019
PO Number	CVD	Receipt Condition	Ambient temperature
Sample Serving Size		Login Date	08-Apr-2019
Description	C19058 119060853	Date Started	08-Apr-2019

Analysis

Result

Multi-Residue Analysis for hemp products - 60+ compounds

Abamectin	<0.05 mg/kg
Aldicarb	<0.05 mg/kg
Aldicarb sulfone (Aldoxycarb)	<0.05 mg/kg
Aldicarb sulfoxide	<0.05 mg/kg
Azoxystrobin	<0.05 mg/kg
Bifenazate	<0.05 mg/kg
Bifenthrin	<0.05 mg/kg
Carbaryl	<0.05 mg/kg
Carbofuran	<0.05 mg/kg
Carbofuran-3-hydroxy-	<0.05 mg/kg
Chlorantraniliprole	<0.05 mg/kg
Chlordane, cis-	<0.05 mg/kg
Chlordane, trans-	<0.05 mg/kg
Chlorfenapyr	<0.05 mg/kg
Chlorpyrifos	<0.05 mg/kg
Coumaphos	<0.05 mg/kg
Cyfluthrin	<0.05 mg/kg
Cypermethrin	<0.05 mg/kg
Cyproconazole (2 diastereoisomers)	<0.05 mg/kg
Cyprodinil	<0.05 mg/kg
Dichlorvos	<0.05 mg/kg
Diclobutrazol	<0.05 mg/kg
Dipropetryn	<0.05 mg/kg
Disulfoton	<0.05 mg/kg
Endosulfan I (alpha-isomer)	<0.05 mg/kg
Endosulfan II (beta-isomer)	<0.05 mg/kg
Endosulfan sulfate	<0.05 mg/kg
Epoxiconazole	<0.05 mg/kg
Ethiofencarb	<0.05 mg/kg
Etofenprox	<0.05 mg/kg
Etoxazole	<0.05 mg/kg
Fenoxycarb	<0.05 mg/kg
Fenpropathrin	<0.05 mg/kg
Fenvalerate/Esfenvalerate (sum of isomers)	<0.05 mg/kg

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Project ID	EUROFINS-20190408-0187	Receipt Date	08-Apr-2019
PO Number	CVD	Receipt Condition	Ambient temperature
Sample Serving Size		Login Date	08-Apr-2019
Description	C19058 119060853	Date Started	08-Apr-2019

Analysis	Result
Multi-Residue Analysis for hemp products - 60+ compounds	
Fipronil	<0.05 mg/kg
Fipronil desulfinyl	<0.05 mg/kg
Fipronil sulfone	<0.05 mg/kg
Imazalil	<0.05 mg/kg
Imidacloprid	<0.05 mg/kg
Malathion	<0.05 mg/kg
Methiocarb	<0.05 mg/kg
Methiocarb sulfone	<0.05 mg/kg
Methiocarb sulfoxide	<0.05 mg/kg
Methomyl	<0.05 mg/kg
Metolachlor	<0.05 mg/kg
Mevinphos (E- and Z-isomers)	<0.05 mg/kg
Myclobutanil	<0.05 mg/kg
Naled (Dibrom)	<0.05 mg/kg
Paclobutrazol	<0.05 mg/kg
Permethrin (sum of isomers)	<0.05 mg/kg
Propoxur	<0.05 mg/kg
Pyrethrum (total)	<0.50 mg/kg
Spinetoram (spinosyns J and L)	<0.05 mg/kg
Spinosad (spinosyns A and D)	<0.05 mg/kg
Spirodiclofen	<0.05 mg/kg
Spiromesifen	<0.05 mg/kg
Spiromesifen enol	<0.05 mg/kg
Spirotetramat	<0.05 mg/kg
Spiroxamine (2 diastereoisomers)	<0.05 mg/kg
Tebuconazole	<0.05 mg/kg
Thiabendazole	<0.05 mg/kg
Thiabendazole-5-hydroxy-	<0.05 mg/kg
Thiacloprid	<0.05 mg/kg
Trifloxystrobin	<0.05 mg/kg

Analysis	LOQ	Limit	Result	Pass/Fail
Residual Solvents - Class 2 Mix C, Class 3 DMSO (Nonvolatile Solvents) *				
2-Methoxyethanol	50 ppm	50 ppm	<50.0 ppm	Pass
2-Ethoxyethanol	160 ppm	160 ppm	<160 ppm	Pass

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Sample Name:	Hemp Oil	Eurofins Sample:	8326162
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PO Number	CVD	Receipt Condition	Ambient temperature
Sample Serving Size		Login Date	08-Apr-2019
Description	C19058 119060853	Date Started	08-Apr-2019

Analysis	LOQ	Limit	Result	Pass/Fail
Residual Solvents - Class 2 Mix C, Class 3 DMSO (Nonvolatile Solvents) *				
N,N-Dimethylformamide	880 ppm	880 ppm	<880 ppm	Pass
N,N-Dimethylacetamide	1090 ppm	1090 ppm	<1090 ppm	Pass
Dimethyl Sulfoxide	250 ppm	250 ppm	<250 ppm	Pass
Ethylene Glycol	620 ppm	620 ppm	<620 ppm	Pass
N-Methylpyrrolidone	530 ppm	530 ppm	<530 ppm	Pass
Formamide	220 ppm	220 ppm	<220 ppm	Pass
Sulfolane	160 ppm	160 ppm	<160 ppm	Pass
Residual Solvents - Class 3, Acids Only *				
Acetic Acid	200 ppm		<200 ppm	
Formic Acid	200 ppm		<200 ppm	

Method References

Testing Location

Multi-Residue Analysis for hemp products - 60+ compounds (PEST_HEMP)

Food Integ. Innovation-Greenfield

Official Methods of Analysis, AOAC Official Method 2007.01, Pesticide Residues in Foods by Acetonitrile Extraction and Partitioning with Magnesium Sulfate, AOAC INTERNATIONAL (modified).

CEN Standard Method EN 15662: Food of plant origin - Determination of pesticide residues using GC-MS and/or LC-MS/MS following acetonitrile extraction/partitioning and clean-up by dispersive SPE - QuEChERS method.

List of the tested pesticides and their limits of quantification (LOQs) are available upon request.

Mycotoxins in Raw Materials (MYCO_REG_S)

Food Integrity Innovation-Madison

Varga, E., Glauner, T., Koppen, R., Mayer, K., Sulyok, M., Schumacher, R., Krska, R. and Berthiller, F., "Stable isotope dilution assay for the accurate determination of mycotoxins in maize by UHPLC-MS/MS," Analytical and BioAnalytical Chemistry, 402:2675-2686 (2012).

Residual Solvents - Class 2 Mix C, Class 3 DMSO (Nonvolatile Solvents) (USPR_DI_S)

Food Integrity Innovation-Madison

United States Pharmacopeia, 39th Rev. - National Formulary 34th Ed., Method <467>, USP Convention, Inc., Rockville, MD (2016). (Modified).

* This analysis or component is not ISO accredited.

Certificate of Analysis

Eurofins BioDiagnostics, Inc.

Method References	Testing Location
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Residual Solvents - Class 3, Acids Only (USPR_ACD_S)

Food Integrity Innovation-Madison

- [1] United States Pharmacopeia, 39th Rev. - National Formulary 34th Ed., Method <467>, USP Convention, Inc., Rockville, MD (2015). (Modified)
- [2] Zhou, D., Hou, Q., Liu, W., Ren, X., "Rapid determination of formic and acetic acids in biomass hydrosylate by headspace gas chromatography," Journal of Industrial and Engineering Chemistry, 47:281-287 (2017).

Terpenes (TERPENES_S)

Food Integrity Innovation-Madison

Internally Developed Method

Testing Location(s)	Released on Behalf of Eurofins by
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Food Integ. Innovation-Greenfield

Karelyn Koehn - Manager

Eurofins Food Chemistry Testing US, Inc.
671 S. Meridian Road
Greenfield IN 46140
800-675-8375



2918.06

Food Integrity Innovation-Madison

Edward Ladwig - Director

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3301 Kinsman Blvd
Madison WI 53704
800-675-8375



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Eurofins Food Integrity and Innovation accepts all liability for work conducted as of 01 Aug 2018.

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CERTIFICATE OF ANALYSIS

BioDiagnostics, Inc.
 Attn: QC Dept.
 507 Highland Drive
 River Falls, WI 54022

AR-19-QR-007184-01

Client Code: QR0000282
 Batch Code: EUUSGA2-00027475
 PO Number: Hemp INTERCO

Report Date: 04/22/2019
 Entry Date: 04/17/2019

Eurofins Sample Code: 111-2019-04170136
 Client Sample Code:
 119060853
 Analysis Date: 4/17/2019

Sample Description: Hemp Oil, C19058
 Condition Upon Receipt: Acceptable

Test	Result
UMPRE - Aerobic Plate Count - AOAC 966.23 Method Reference: AOAC 966.23 *Aerobic Plate Count	< 10 cfu/g
UMN2K - Yeast - BAM Chapter 18 Method Reference: FDA BAM Chapter 18 *Yeast *Moulds	< 10 cfu/g < 10 cfu/g
UM73J - Total Coliforms - AOAC 991.14 Method Reference: AOAC 991.14 *Coliforms *Escherichia coli	< 10 cfu/g < 10 cfu/g
UMN6C - Salmonella spp. - AOAC 2004.03 Method Reference: AOAC 2004.03 Salmonella	Not Detected per 25 g
UM7TC - Listeria spp. - AOAC 2004.06 Method Reference: AOAC 2004.06 Listeria Species	Not Detected per 25 g

**The test result is covered by our current A2LA accreditation.*

CERTIFICATE OF ANALYSISBioDiagnostics, Inc.
Attn: QC Dept.
507 Highland Drive
River Falls, WI 54022

AR-19-QR-007184-01

Client Code: QR0000282
Batch Code: EUUSGA2-00027475
PO Number: Hemp INTERCOReport Date: 04/22/2019
Entry Date: 04/17/2019Respectfully Submitted,
Eurofins Scientific, Inc.Viridiana Castro
Microbiology Supervisor

Testing Cert #3329.05

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All results are reported on an "As Received" basis unless otherwise stated.
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Eurofins BioDiagnostics Inc
507 Highland Drive
River Falls WI, 54022

Project: Hemp Testing
Project Number: Hemp Testing
Project Manager: Darcey Rodewald

Reported:
12-Apr-19 18:35

119060853 Hemp Oil, C19058

9D00314-01

Analysis	Result	LOD	LOQ	Action Limit	Pass/Fail	Method
Arsenic	Not Detected (< 0.0009 ppm)	0.0009	1.50	1.5	Pass	ICP-MS/AOAC 993.14
Cadmium	Not Detected (< 0.002 ppm)	0.002	0.500	0.5	Pass	ICP-MS/AOAC 993.14
Lead	0.002 ppm * < LOQ	0.002	0.500	0.5	Pass	ICP-MS/AOAC 993.14
Mercury	Not Detected (< 0.002 ppm)	0.002	3.00	3	Pass	ICP-MS/AOAC 993.14

Note: * <LOQ identifier denotes the analyte was detected below the LOQ but above the LOD. This result is considered an estimated concentration.

Eurofins Frontier Global Sciences, LLC

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

REPORT OF ANALYSIS

Customer: Eurofins BioDiagnostics
507 Highland Drive
River Falls WI 54022
Attn: Darcey Rodewald

Date Received: 04/08/19
Report Date: 04/10/19

***Description:** 119060853
Lab Number: CH94475
Commodity: HEMP OIL C19058

Analysis	Result	Unit	MDL	Analyzed	Reference
Gluten (ELISA) - Wheat Rye & Barley	<3.0	ppm	3.0	04/10/19	R7001

*The results shown in this report relate solely to the item submitted for analysis.

ISO/IEC 17025

Testing Cert. 1940.01

**Eurofins GeneScan**

Dr. Frank Spiegelhalter
Executive Vice President