

# Certificate of Analysis

507 Highland Drive  
 River Falls, WI, 54022  
 Phone: (715) 426-0246  
 Fax: (715) 426-0251  
 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, MB R2R 1V4  
**Phone:**

**Date Reported:** 05/24/2019  
**Date Completed:** 05/23/2019  
**Date Received:** 05/21/2019  
**Testing Method:** HPLC-DAD

Sample Information		Cannabinoid Name	ID	Weight %	Conc. mg/g	Conc. mg/mL
<b>Sample No:</b>	119081665	Cannabichromenic Acid	CBCA	ND	ND	
<b>Crop:</b>	Hemp, Industrial	Cannabicyclol	CBL	<LOQ	<LOQ	
<b>Variety:</b>	BSHE Unflavored Tincture	Cannabidiol	CBD	1.061	10.61	
<b>Lot:</b>	E19012	Cannabidiolic Acid	CBDA	ND	ND	
<b>Seed Size:</b>		Cannabidivarin	CBDV	<LOQ	<LOQ	
<b>Customer Tracking#:</b>		Cannabidivarinic Acid	CBDVA	ND	ND	
<b>Seeds Per Pound:</b>		Cannabigerol	CBG	ND	ND	
<b>Batch:</b>		Cannabigerolic Acid	CBGA	ND	ND	
<b>LIMS:</b>		Cannabichromene	CBC	0.006	0.06	
<b>IL:</b>		Cannabinol	CBN	ND	ND	
		Cannabinolic Acid	CBNA	ND	ND	
<b>Comments:</b>	LOQ= 50 ppm or 0.005 wt %	$\Delta^9$ -Tetrahydrocannabinol	$\Delta^9$ -THC	ND	ND	
		$\Delta^8$ -Tetrahydrocannabinol	$\Delta^8$ -THC	ND	ND	
		Tetrahydrocannabinolic Acid A	THCA-A	ND	ND	
		Tetrahydrocannabivarin	THCV	ND	ND	
		Tetrahydrocannabivarinic Acid	THCVA	ND	ND	
		Total Cannabinoids		1.067	10.67	
		Total THC*		ND	ND	



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

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*Joseph Zalusky*

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

## Certificate of Analysis

Eurofins BioDiagnostics, Inc.

<b>Sample Name:</b>	<b>Unflavored Tincture</b>	<b>Eurofins Sample:</b>	<b>8482878</b>
<b>Project ID</b>	EUROFINS-20190523-0533	<b>Receipt Date</b>	23-May-2019
<b>PO Number</b>	CVD	<b>Receipt Condition</b>	Ambient temperature
<b>Sample Serving Size</b>		<b>Login Date</b>	23-May-2019
<b>Description</b>	119081665	<b>Date Started</b>	24-May-2019
		<b>Number Composited</b>	2

Analysis	Result
<b>Terpenes *</b>	
(-)-alpha-Bisabolol	15 mg/100g
Camphene	<1.0 mg/100g
(1S)-(+)-3-Carene	<1.0 mg/100g
beta-Caryophyllene	6.3 mg/100g
p-Cymene	<1.0 mg/100g
Eucalyptol	<1.0 mg/100g
alpha-Humulene (alpha-Caryophyllene)	2.2 mg/100g
(-)-Isopulegol	<1.0 mg/100g
(R)-(+)-Limonene	<1.0 mg/100g
Linalool	<1.0 mg/100g
beta-Myrcene	2.2 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
<b>Mycotoxins in Raw Materials</b>	
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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<b>Sample Name:</b>	<b>Unflavored Tincture</b>	<b>Eurofins Sample:</b>	<b>8482878</b>
<b>Project ID</b>	EUROFINS-20190523-0533	<b>Receipt Date</b>	23-May-2019
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<b>Description</b>	119081665	<b>Date Started</b>	24-May-2019
		<b>Number Composited</b>	2

### 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

\* This analysis or component is not ISO accredited.

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Analysis	Result
<b>Multi-Residue Analysis for hemp products - 60+ compounds</b>	
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
<b>Residual Solvents - Class 2 Mix C, Class 3 DMSO (Nonvolatile Solvents) *</b>				
2-Methoxyethanol	50 ppm	50 ppm	<50.0 ppm	Pass

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<b>Description</b>	119081665	<b>Date Started</b>	24-May-2019
		<b>Number Composited</b>	2

Analysis	LOQ	Limit	Result	Pass/Fail
<b>Residual Solvents - Class 2 Mix C, Class 3 DMSO (Nonvolatile Solvents) *</b>				
2-Ethoxyethanol	160 ppm	160 ppm	<160 ppm	Pass
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
<b>Residual Solvents - Class 3, Acids Only *</b>				
Acetic Acid	200 ppm		<200 ppm	
Formic Acid	200 ppm		<200 ppm	

Method References	Testing Location
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**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**

Eurofins Food Chemistry Testing US, Inc.  
3301 Kinsman Blvd  
Madison WI 53704  
800-675-8375



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**\* This analysis or component is not ISO accredited.**

## CERTIFICATE OF ANALYSIS

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

AR-19-QR-010362-01

Client Code: QR0000282  
Batch Code: EUUSGA2-00029025  
PO Number: Hemp INTERCO

Report Date: 05/29/2019  
Entry Date: 05/23/2019

**Eurofins Sample Code: 111-2019-05230044**  
Client Sample Code:  
119081665  
Analysis Date: 5/23/2019

Sample Description: BSHE Unflavored Tincture  
Condition Upon Receipt: Acceptable

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

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

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

AR-19-QR-010362-01

Client Code: QR0000282  
Batch Code: EUUSGA2-00029025  
PO Number: Hemp INTERCOReport Date: 05/29/2019  
Entry Date: 05/23/2019Respectfully Submitted,  
Eurofins Scientific, Inc.Viridiana Castro  
Microbiology Supervisor

Testing Cert #3329.05

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Retained samples are discarded 30 days after receipt; certain exceptions apply.

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## Certificate of Analysis

Eurofins BioDiagnostics, Inc.

<b>Sample Name:</b>	<b>Unflavored Tincture</b>	<b>Eurofins Sample:</b>	<b>8482878</b>
<b>Project ID</b>	EUROFINS-20190523-0533	<b>Receipt Date</b>	23-May-2019
<b>PO Number</b>	CVD	<b>Receipt Condition</b>	Ambient temperature
<b>Sample Serving Size</b>		<b>Login Date</b>	23-May-2019
<b>Description</b>	119081665	<b>Date Started</b>	24-May-2019
		<b>Number Composited</b>	2

Analysis	Result
<b>Elements by ICP Mass Spectrometry</b>	
Arsenic	<10.0 ppb
Cadmium	<5.00 ppb
Lead	<5.00 ppb
Mercury	<5.00 ppb

Method References	Testing Location
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<b>Elements by ICP Mass Spectrometry (ICP_MS_S)</b>	<b>Food Integrity Innovation-Madison</b>
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Official Methods of Analysis, Method 2011.19 and 993.14, AOAC INTERNATIONAL, (Modified).  
 Pequette, L.H., Szabo, A., Thompson, J.J., "Simultaneous Determination of Chromium, Selenium, and Molybdenum in Nutritional Products by Inductively Coupled Plasma/Mass Spectrometry: Single-Laboratory Validation," Journal of AOAC International, 94(4): 1240 - 1252 (2011).

Testing Location(s)	Released on Behalf of Eurofins by
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**Food Integrity Innovation-Madison**

**Edward Ladwig - Director**

Eurofins Food Chemistry Testing US, Inc.  
 3301 Kinsman Blvd  
 Madison WI 53704  
 800-675-8375



2918.01

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**REPORT OF ANALYSIS**

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

**Date Received:** 05/23/19  
**Report Date:** 05/28/19

**Description:** 119081665  
**Lab Number:** CI00773  
**Commodity:** UNFLAVORED TINCTURE

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Analysis	Result	Unit	MDL	Analyzed	Reference
Gluten (ELISA) - Wheat Rye & Barley	<3.0	ppm	3.0	05/28/19	R7001

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

**ISO/IEC 17025**

Testing Cert. 1940.01

Eurofins GeneScan



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**Dr. Frank Spiegelhalter**  
Executive Vice President