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Report Number:	**2361118-0**
Report Date:	**15-Jan-2019**
Report Status:	**Final**
Supercedes :	**2352370-0**

Certificate of Analysis

Earthrise Nutritionals

113E Hoober Rd
Calipatria CA 92233

Sample Name:	**Blend production 2018 (Natural Spirulina Blend Production 2018)**	**Eurofins Sample:**	**7918103**
Project ID	EARTHRISE-20181130-0110	**Receipt Date**	30-Nov-2018
PO Number	16890	**Receipt Condition**	Ambient temperature
Sample Serving Size		**Login Date**	30-Nov-2018
		Number Composited	6
		Online Order	20

Analysis	Result
Calories	
Calories	379 Cal/100g
Calories from Fat	
Calories	55.0 Cal/100g
Fat by Acid Hydrolysis	
Fat	7.5 g/100g
Fatty Acid Profile	
Saturated Fatty Acids (Acid Form)	2.68 g/100g
Total Cis Unsaturated Fatty Acids (Acid Form)	3.13 g/100g
Monounsaturated Fatty Acids (Acid Form)	0.374 g/100g
Polyunsaturated Fatty Acids (Acid Form)	2.76 g/100g
Trans Fatty Acids (Acid Form)	0.021 g/100g
Omega 3 Fatty Acids	<0.007 g/100g
Omega 6 Fatty Acids	2.88 g/100g
Omega 7 Fatty Acids	0.292 %
Omega 9 Fatty Acids	0.099 g/100g
Total Fatty Acids	6.11 g/100g
4:0 Butyric	<0.007 g/100g
6:0 Caproic	<0.007 g/100g
8:0 Caprylic	<0.007 g/100g
10:0 Capric	<0.007 g/100g
12:0 Lauric	<0.007 g/100g
14:0 Myristic	<0.007 g/100g
14:1 Myristoleic	<0.007 g/100g
15:0 Pentadecanoic	<0.007 g/100g
15:1 Pentadecenoic	<0.007 g/100g
16:0 Palmitic	2.74 g/100g
16:1 Palmitoleic	0.254 g/100g

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Analysis	Result
Fatty Acid Profile	
17:0 Heptadecanoic	0.011 g/100g
17:1 Heptadecenoic	<0.007 g/100g
18:0 Stearic	0.062 g/100g
9c 18:1 Oleic	0.099 g/100g
11c 18:1 Vaccenic	0.038 %
18:2 Linoleic	1.29 g/100g
18:3 Gamma Linolenic	1.56 g/100g
18:3 Alpha Linolenic	<0.007 g/100g
18:4 Octadecatetraenoic	<0.007 g/100g
20:0 Arachidic	<0.007 g/100g
20:1 Eicosenoic	<0.007 g/100g
20:2 Eicosadienoic	0.015 g/100g
20:3 Eicosatrienoic (n3)	<0.007 g/100g
20:3 Homogamma Linolenic (n6)	0.019 g/100g
20:4 Arachidonic (n3)	<0.007 g/100g
20:4 Arachidonic (n6)	<0.007 g/100g
20:5 Eicosapentaenoic	<0.007 g/100g
21:5 Heneicosapentaenoic	<0.007 g/100g
22:0 Behenic	<0.007 g/100g
22:1 Erucic	<0.007 g/100g
22:2 Docosadienoic	<0.007 g/100g
22:3 Docosatrienoic	<0.007 g/100g
22:4 Docosatetraenoic	<0.007 g/100g
22:5 Docosapentaenoic (n3)	<0.007 g/100g
22:5 Docosapentaenoic (n6)	<0.007 g/100g
22:6 Docosahexaenoic	<0.007 g/100g
24:0 Lignoceric	<0.007 g/100g

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Analysis	Result
Fatty Acid Profile	
24:1 Nervonic	<0.007 g/100g
Total 18:1 trans	<0.007 g/100g
Total 18:1 cis	0.137 g/100g
Total 18:2 trans	0.022 g/100g
Total 18:3 trans	<0.007 g/100g
Cholesterol	
Cholesterol	<1.0 mg/100g
Carbohydrates	
Total Carbohydrates	12.7 g/100g
Total Dietary Fiber	
Total Dietary Fiber	5.60 g/100g
Crude Fiber *	
Crude Fiber	1.29 g/100g
Sugar Profile	
Fructose	<0.1 g/100g
Glucose	<0.1 g/100g
Sucrose	<0.1 g/100g
Lactose	<0.1 g/100g
Maltose	<0.1 g/100g
Galactose	<0.1 g/100g
Total Sugar	<0.1 g/100g
Protein (N x 6.25) Dumas Method	
Protein	68.4 g/100g
Vitamin A from Carotenes	
Vitamin A From Carotene	303000 IU/100g
Carotenes	
Beta Carotene	182 mg/100g

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Analysis	Result
Carotenes	
Lutein	<0.0200 mg/100g
Zeaxanthin	107 mg/100g
Cryptoxanthin	11.7 mg/100g
Vitamin C (by HPLC)	
Vitamin C	<1.00 mg/100g
Elements by ICP Emission Spectrometry	
Calcium	350 mg/100g
Copper	0.510 mg/100g
Iron	96.9 mg/100g
Magnesium	333 mg/100g
Manganese	3.57 mg/100g
Phosphorus	995 mg/100g
Potassium	1640 mg/100g
Sodium	847 mg/100g
Zinc	1.96 mg/100g
Aluminum *	28.9 mg/100g
Barium *	<1.85 mg/100g
Boron *	<3.70 mg/100g
Chromium *	<3.70 mg/100g
Molybdenum *	<3.70 mg/100g
Strontium *	6.28 mg/100g
Vitamin D by LCMS	
Total Vitamin D3 (mcg units)	<0.100 mcg/100g
Total Vitamin D2 (mcg units)	<0.100 mcg/100g
Vitamin E	
Vitamin E Synthetic	8.58 IU/100g
Vitamin K	

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Analysis	Result
Vitamin K	
Vitamin K1	1140 mcg/100g
Thiamin by Fluorometric Method	
Thiamin	0.58 mg/100g
Riboflavin by Microbiological Method	
Riboflavin	3.73 mg/100g
Niacin by Microbiological Method	
Niacin	18.0 mg/100g
Pyridoxine	
Pyridoxine	0.839 mg/100g
Folic Acid by Microbiological Method	
Folates (may contain folic acid)	161 mcg/100g
Vitamin B12 by Microbiological Method	
Vitamin B12	155 mcg/100g
Biotin by Microbiological Method	
Biotin	10.1 mcg/100g
Pantothenic Acid by Microbiological Method	
Pantothenic Acid	0.34 mg/100g
Inositol *	
Inositol	76.6 mg/100g
Chloride	
Chloride	444 mg/100g
Salt	0.732 g/100g
Sulfur *	
Sulfur	776 mg/100g
Amino Acids	
Aspartic Acid	6430 mg/100g
Threonine	3160 mg/100g

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Analysis	Result
Amino Acids	
Serine	3080 mg/100g
Glutamic Acid	9220 mg/100g
Proline	2400 mg/100g
Glycine	3240 mg/100g
Alanine	4750 mg/100g
Valine	3630 mg/100g
Isoleucine	3580 mg/100g
Leucine	5870 mg/100g
Tyrosine	3010 mg/100g
Phenylalanine	2880 mg/100g
Lysine	3060 mg/100g
Histidine	1020 mg/100g
Arginine	4740 mg/100g
Cystine	690 mg/100g
Methionine	1410 mg/100g
Tryptophan	
Tryptophan	938 mg/100g
Ash	
Ash	7.64 g/100g
Moisture by M100_T100	
Moisture	5.21 g/100g
Elements by ICP Mass Spectrometry	
Arsenic	278 ppb
Cadmium	17.9 ppb
Lead	87.2 ppb
Mercury	<5.00 ppb
Heavy Metals *	

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Analysis	Result
Heavy Metals *	
Heavy Metals	<5 ppm
Iodine by ICP-MS	
Iodine	57.0 mcg/100g
Selenium *	
Selenium	16.4 mcg/100g
Regulated Mycotoxins in Raw Materials Using UHPLC-MS/MS	
Aflatoxin B1	<0.500 ppb
Aflatoxin B2	<0.500 ppb
Aflatoxin G1	<0.500 ppb
Aflatoxin G2	<0.500 ppb
Multi-Residue Analysis (300+ Compounds)	
Matrix Type - To Determine Limit of Quantification (LOQ)	Spices - Botanicals - and other Specialty Samples
All tested pesticides	Below LOQ
Polycyclic Aromatic Hydrocarbons-Low Level	
Benz(a)anthracene	<0.250 ppb
Benzo(a)pyrene	<0.250 ppb
Benzo(b)fluoranthene	<0.250 ppb
Benzo(g,h,i)perylene	<0.250 ppb
Benzo(k)fluoranthene	<0.250 ppb
Chrysene	<0.250 ppb
Dibenz(a,h)anthracene	<0.250 ppb
Indeno(1,2,3-c,d)pyrene	<0.250 ppb
Pyrene	0.634 ppb

Analysis	Limit	Result	Pass/Fail
Bromide per USP <561>			
Bromide, inorganic (calculated as Bromide Ion)	125 mg/kg	<125 mg/kg	Pass

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Analysis	Limit	Result	Pass/Fail
Total Content of Dithiocarbamates (DTCs) expressed as CS2 per USP <561>			
Total Content of Dithiocarbamates (DTCs) expressed as CS2	2 mg/kg	<2 mg/kg	Pass
USP <561> Pesticides			
Acephate	0.1 mg/kg	<0.1 mg/kg	Pass
Alachlor	0.05 mg/kg	<0.05 mg/kg	Pass
Aldrin and dieldrin (sum of)	0.05 mg/kg	<0.05 mg/kg	Pass
Azinphos-ethyl	0.1 mg/kg	<0.1 mg/kg	Pass
Azinphos-methyl	1 mg/kg	<1 mg/kg	Pass
Bromophos-ethyl	0.05 mg/kg	<0.05 mg/kg	Pass
Bromophos-methyl	0.05 mg/kg	<0.05 mg/kg	Pass
Bromopropylate	3 mg/kg	<3 mg/kg	Pass
Chlordane (sum of cis- and trans- isomers and oxychlordane)	0.05 mg/kg	<0.05 mg/kg	Pass
Chlorfenvinphos	0.5 mg/kg	<0.5 mg/kg	Pass
Chlorpyrifos-ethyl	0.2 mg/kg	<0.2 mg/kg	Pass
Chlorpyrifos-methyl	0.1 mg/kg	<0.1 mg/kg	Pass
Chlorthal-dimethyl	0.01 mg/kg	<0.01 mg/kg	Pass
Cyfluthrin (sum of isomers)	0.1 mg/kg	<0.1 mg/kg	Pass
Cyhalothrin, lambda-	1 mg/kg	<1 mg/kg	Pass
Cypermethrin (sum of isomers)	1 mg/kg	<1 mg/kg	Pass
DDT (sum of o,p'-DDT, p,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD, and p,p'-DDD)	1 mg/kg	<1 mg/kg	Pass
Deltamethrin	0.5 mg/kg	<0.5 mg/kg	Pass
Diazinon	0.5 mg/kg	<0.5 mg/kg	Pass
Dichlofluanid	0.1 mg/kg	<0.1 mg/kg	Pass
Dichlorvos	1 mg/kg	<1 mg/kg	Pass
Dicofol	0.5 mg/kg	<0.5 mg/kg	Pass
Dimethoate and omethoate (sum of)	0.1 mg/kg	<0.1 mg/kg	Pass
Endosulfan (sum of isomers and endosulfan sulfate)	3 mg/kg	<3 mg/kg	Pass

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Analysis	Limit	Result	Pass/Fail
USP <561> Pesticides			
Endrin	0.05 mg/kg	<0.05 mg/kg	Pass
Ethion	2 mg/kg	<2 mg/kg	Pass
Etrimphos	0.05 mg/kg	<0.05 mg/kg	Pass
Fenchlorphos (sum of fenchlorphos and fenchlorphos-oxon)	0.1 mg/kg	<0.1 mg/kg	Pass
Fenitrothion	0.5 mg/kg	<0.5 mg/kg	Pass
Fenpropathrin	0.03 mg/kg	<0.03 mg/kg	Pass
Fensulfothion (sum of fensulfothion, fensulfothion-oxon, fensulfothion-oxon sulfone and fensulfothion sulfone)	0.05 mg/kg	<0.05 mg/kg	Pass
Fenthion (sum of fenthion, fenthion-oxon, fenthion-oxon sulfone, fenthion-oxon sulfoxide, fenthion sulfone and fenthion sulfoxide)	0.05 mg/kg	<0.05 mg/kg	Pass
Fenvalerate	1.5 mg/kg	<1.5 mg/kg	Pass
Flucythrinate	0.05 mg/kg	<0.05 mg/kg	Pass
Fluvalinate, tau-	0.05 mg/kg	<0.05 mg/kg	Pass
Fonofos	0.05 mg/kg	<0.05 mg/kg	Pass
Heptachlor (sum of heptachlor and cis- and trans-heptachlor epoxides)	0.05 mg/kg	<0.05 mg/kg	Pass
Hexachlorobenzene	0.1 mg/kg	<0.1 mg/kg	Pass
Hexachlorocyclohexane isomers (other than gamma)	0.3 mg/kg	<0.3 mg/kg	Pass
Lindane (gamma-hexachlorocyclohexane)	0.6 mg/kg	<0.6 mg/kg	Pass
Malathion and malaoxon (sum of)	1 mg/kg	<1 mg/kg	Pass
Mecarbam	0.05 mg/kg	<0.05 mg/kg	Pass
Methacriphos	0.05 mg/kg	<0.05 mg/kg	Pass
Methamidophos	0.05 mg/kg	<0.05 mg/kg	Pass
Methidathion	0.2 mg/kg	<0.2 mg/kg	Pass
Methoxychlor	0.05 mg/kg	<0.05 mg/kg	Pass
Mirex	0.01 mg/kg	<0.01 mg/kg	Pass
Monocrotophos	0.1 mg/kg	<0.1 mg/kg	Pass

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Analysis	Limit	Result	Pass/Fail
USP <561> Pesticides			
Parathion-ethyl and paraoxon-ethyl (sum of)	0.5 mg/kg	<0.5 mg/kg	Pass
Parathion-methyl and paraoxon-methyl (sum of)	0.2 mg/kg	<0.2 mg/kg	Pass
Pendimethalin	0.1 mg/kg	<0.1 mg/kg	Pass
Pentachloranisol	0.01 mg/kg	<0.01 mg/kg	Pass
Permethrin (sum of isomers)	1 mg/kg	<1 mg/kg	Pass
Phosalone	0.1 mg/kg	<0.1 mg/kg	Pass
Phosmet	0.05 mg/kg	<0.05 mg/kg	Pass
Piperonyl butoxide	3 mg/kg	<3 mg/kg	Pass
Pirimiphos-ethyl	0.05 mg/kg	<0.05 mg/kg	Pass
Pirimiphos-methyl (sum of pirimiphos-methyl and N-desethyl-pirimiphos-methyl)	4 mg/kg	<4 mg/kg	Pass
Procymidone	0.1 mg/kg	<0.1 mg/kg	Pass
Profenophos	0.1 mg/kg	<0.1 mg/kg	Pass
Prothiophos	0.05 mg/kg	<0.05 mg/kg	Pass
Pyrethrum (sum of cinerin I, cinerin II, jasmolin I, jasmolin II, pyrethrin I, and pyrethrin II)	3 mg/kg	<3 mg/kg	Pass
Quinalphos	0.05 mg/kg	<0.05 mg/kg	Pass
Quintozene (sum of quintozene, pentachloroaniline and methyl pentachlorophenyl sulfide)	1 mg/kg	<1 mg/kg	Pass
S-421	0.02 mg/kg	<0.02 mg/kg	Pass
Tecnazene	0.05 mg/kg	<0.05 mg/kg	Pass
Tetradifon	0.3 mg/kg	<0.3 mg/kg	Pass
Vinclozolin	0.4 mg/kg	<0.4 mg/kg	Pass

Method References	Testing Location
Amino Acids (TAALC_S)	**Food Integrity Innovation-Madison**

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Method References	Testing Location

Amino Acids (TAALC_S) — **Food Integrity Innovation-Madison**

R. Schuster, "Determination of Amino Acids in Biological, Pharmaceutical, Plant and Food Samples by Automated Precolumn Derivatization and HPLC", Journal of Chromatography, 1988, 431, 271-284.

Henderson, J.W., Ricker, R.D. Bidlingmeyer, B.A., Woodward, C., "Rapid, Accurate, Sensitive, and Reproducible HPLC Analysis of Amino Acids, Amino Acid Analysis Using Zorbax Eclipse-AAA columns and the Agilent 1100 HPLC," Agilent Publication, 2000. Barkholt and Jensen, "Amino Acid Analysis: Determination of Cysteine plus Half-Cystine in Proteins after Hydrochloric Acid Hydrolysis with a Disulfide Compound as Additive", Analytical Biochemistry, 177, 318-322 (1989).

Henderson, J.W., Brooks, A., "Improved Amino Acid Methods using Agilent Zorbax Eclipse Plus C18 Columns for a Variety of Agilent LC Instrumentation and Separation Goals," Agilent Application Note 5990-4547 (2010).

Ash (ASHM_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 923.03, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)

Biotin by Microbiological Method (BIOM_S) — **Food Integrity Innovation-Madison**

Scheiner, J. and De Ritter, E., "Biotin Content of Feedstuffs," *Journal of Agricultural and Food Chemistry*, 23(6): 1157-1162 (1975). (Modified)

Wright, L.D., Skeggs, H.R., "Determination of Biotin with Lactobacillus arabinosis," *Procedures of the Society of Experimental Biology and Medicine,* 56:95-98 (1944). (Modified)

Free Biotin, Section C-13, *Methods of Analysis for Infant Formulas*, Infant Formula Council, (1985). (Modified)

Scheiner, J., "Extraction of Added Biotin From Animal Feed Premix," *Journal of the AOAC,* 49(4):882-883, (1996). (Modified)

Bromide per USP <561> (MEBR_PKG) — **Food Integ. Innovation-Greenfield**

Community Reference Laboratory for Single Residue Methods, CVUA, Stuttgart, Schaglandstr 3/2, 70736 Fellbach, Germany.

T. Stijve, Gas Chromatographic Determination of Inorganic Bromide Residues - a Simplified Procedure, Dtsch. Lebenm Rundsch 77 99-101 (1981).

Deutsche Forschungsgeneinschaft (DFG), Manual of Pesticide Residue Analysis, Volume I by Verlag Chemie, 1987 ISBN 3-527-27010-8

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Method References	Testing Location
Calories (CALC)	**Food Integrity Innovation-Madison**
Code of Federal Regulations, Title 21, Part 101.9, pp. 24-25.	
Calories from Fat (CFAT)	**Food Integrity Innovation-Madison**
Code of Federal Regulations, Title 21, Part 101.9, pp. 24-25.	
Carbohydrates (CHO)	**Food Integrity Innovation-Madison**
United States Department of Agriculture, "Energy Value of Foods", Agriculture Handbook No. 74, pp. 2-11, (1973).	
Carotenes (CAR1_S)	**Food Integrity Innovation-Madison**
Official Methods of Analysis, Method 2005.07, AOAC INTERNATIONAL, (modified). Quackenbush, F. W., "Reverse Phase HPLC Separation of cis- and trans-Carotenoids and Its Application to Beta Carotenes in Food Materials," *Journal of Liquid Chromatography*, 10: 643-653 (1987) (modified).	
Carotenes (CAR2_S)	**Food Integrity Innovation-Madison**
Official Methods of Analysis of AOAC INTERNATIONAL, Methods 941.15 and 2005.07, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (Modified).	
Quackenbush, F. W., "Reverse Phase HPLC Separation of cis- and trans-Carotenoids and Its Application to Beta Carotenes in Food Materials," *Journal of Liquid Chromatography*, 10: 643-653 (1987) (Modified). (Lutein esters)	
Official Methods of Analysis of AOAC INTERNATIONAL, Methods 970.64 and 2005.07, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (Modified). (Lutein esters)	
Chloride (CL_SALT_S)	**Food Integrity Innovation-Madison**
Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 963.05, 971.27, and 986.26, AOAC INTERNATIONAL, Gaithersburg, MD, (2005) (Modified).	
Cholesterol (CHOK_S)	**Food Integrity Innovation-Madison**
Official Methods of Analysis of AOAC INTERNATIONAL 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA,(2005), Official Method 994.10. (Modified)	
Crude Fiber (CFIB_S)	**Food Integrity Innovation-Madison**
Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 962.09.	

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Method References	Testing Location

Elements by ICP Emission Spectrometry (ICP_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, Method 984.27, 985.01, and 2011.14, AOAC INTERNATIONAL, Gaithersburg, MD, USA. (Modified)

Elements by ICP Mass Spectrometry (ICP_MS_S) — **Food Integrity Innovation-Madison**

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).

Fat by Acid Hydrolysis (FAT_AH_S) — **Food Integrity Innovation-Madison**

Food Products that are not Dairy, Egg or Cheese Products
Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 922.06 and 954.02, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)

Cheese and Cheese Products
Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 933.05. (Modified)

Egg, Egg Products, and Mayonnaise
Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 925.32. (Modified)

Fatty Acid Profile (FALT_S) — **Food Integrity Innovation-Madison**

Official Method No. 996.06, Official Methods of Analysis of the AOAC INTERNATIONAL (modified), 19th Ed., AOAC INTERNATIONAL: Gaithersburg, Maryland (2012).

Official Methods and Recommended Practices of the AOCS, Official methods Ce 2b-11 (2011), Ce 1h-05 (2009), Ce 1j-07 (2013), Ce 2-66 (2009),The American Oil Chemists' Society, Champaign, IL (modified).

Folic Acid by Microbiological Method (FOAN_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, Method 992.05 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA (Modified).

"Methods of Analysis for Infant Formulas," Infant Formula Council, Atlanta, GA, Section C-2 (1985) (Modified).

Heavy Metals (HYMT_S) — **Food Integrity Innovation-Madison**

The United States Pharmacopeia, 32nd Revision, Method 231, United States Pharmacopeial Convention, Inc.: Rockville, Maryland (2009). (Modified)

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

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Method References	Testing Location

Inositol (INOS_IC_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Method 2012.12, AOAC INTERNATIONAL, Gaithersburg, MD.

Ellingson, D.; Pritchard, T.; Foy, P.; King, K; Mitchell, B.; Austad, J.; Winters, D.; Sullivan, D. "Analysis of Free and Total Myo-Inositol in Foods, Feeds, and Infant Formula by High-Performance Anion Exchange Chromatography with Pulsed Amperometric Detection, Including a Novel Total Extraction Using Microwave-Assisted Acid Hydrolysis and Enzymatic Treatment" Journal of AOAC INTERNATIONAL, 95(5): 1469-1478 (2012).

Iodine by ICP-MS (IODICPMS_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, Current Ed., Method 2012.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA.

Moisture by M100_T100 (M100T100_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 925.09 and 926.08, AOAC INTERNATIONAL, Gaithersburg, MD, USA,(2005). (Modified).

Multi-Residue Analysis (300+ Compounds) (PS03_S) — **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.

Niacin by Microbiological Method (NIAP_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 944.13 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD (Modified)

Pantothenic Acid by Microbiological Method (PANN_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 945.74, 992.07, and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD (Modified).

Polycyclic Aromatic Hydrocarbons-Low Level (LLPAH_S) — **Food Integrity Innovation-Madison**

Covance Inc. developed method

Protein (N x 6.25) Dumas Method (DGEN_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 968.06 and 992.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)

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Pyridoxine (B6A_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Method 961.15, AOAC INTERNATIONAL (Modified).

Atkins, L., Schultz, A. S., Williams, W. L., and Frey, C. N., "Yeast Microbiological Methods for Determination of Vitamins," *Industrial and Engineering Chemistry, Analytical Edition*, *15*(2):141-144, (1943).

Regulated Mycotoxins in Raw Materials Using UHPLC-MS/MS (MYCO_AFL_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).

Riboflavin by Microbiological Method (B2FV_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 940.33 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD (Modified).

Selenium (SEICPMS_S) — **Food Integrity Innovation-Madison**

Sullivan, D., Zywicki, R., Yancey, M., “Method for the Determination of Total Selenium in a Wide Variety of Foods Using Inductively Coupled Plasma/Mass Spectrometry” Journal of the AOAC INTERNATIONAL, 96 (4): 786-794 (2013). (Modified).

Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 2011.19 (2011). (Modified).

Sugar Profile (SUGN_S) — **Food Integrity Innovation-Madison**

Mason, B. S., and Slover, H. T., "A Gas Chromatographic Method for the Determination of Sugars in Foods," Journal of Agricultural and Food Chemistry 19(3):551-554 (1971). (Modified)

Brobst, K. M., "Gas-Liquid Chromatography of Trimethylsilyl Derivatives, Methods in Carbohydrate Chemistry," 6:3-8, Academic Press, New York, NY, (1972). (Modified)

Sulfur (ICP_MS_S_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 2011.19 and 993.14, AOAC INTERNATIONAL (Modified).
Paquette, 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): 1240-1242 (2011).

Thiamin by Fluorometric Method (BIDE_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 942.23, 953.17, and 957.17, AOAC INTERNATIONAL (Modified).

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Total Content of Dithiocarbamates (DTCs) expressed as CS2 per USP <561> (DTC_PKG) — **Food Integ. Innovation-Greenfield**

Hayama, T. and Takada, M., "Simple and Rapid method for the determination of Ethylenebisdithiocarbamate Fungicides in Fruits and Vegetables Using Liquid Chromatography with Tandem Mass Spectrometry," *Anal. Bioanal. Chem., 392:969-976* (2008).

Total Dietary Fiber (TDFL_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL 18th Ed., Method 991.43, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)

Tryptophan (TRPLC_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, AOAC International Gaithersburg, MD, USA, Official Method 988.15.

R. Schuster, "Determination of Amino Acids in Biological, Pharmaceutical, Plant and Food Samples by Automated Precolumn Derivatization and HPLC", Journal of Chromatography. 1988, 431, 271-284.

Henderson, J.W., Ricker, R.D. Bidlingmeyer, B.A., Woodward, C., "Rapid, Accurate, Sensitive, and Reproducible HPLC Analysis of Amino Acids, Amino Acid Analysis Using Zorbax Eclipse-AAA columns and the Agilent 1100 HPLC," Agilent Publication, 2000.

Henderson, J.W., Brooks, A., "Improved Amino Acid Methods using Agilent Zorbax Eclipse Plus C18 Columns for a Variety of Agilent LC Instrumentation and Separation Goals," Agilent Application Note 5990-4547 (2010).

USP <561> Pesticides (PS01_SA_S) — **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.

EP Chapter 2.8.13 Pesticide Residues, The European Pharmacopoeia

USP Chapter <561> Articles of Botanical Origin, The United States Pharmacopeia

Please contact us if you want a complete listing of all compounds determined during testing.

Vitamin A from Carotenes (BCAV_S) — **Food Integrity Innovation-Madison**

Calculation on request.

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Method References	Testing Location

Vitamin B12 by Microbiological Method (B12F_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Method 952.20 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (modified)

Methods of Analysis for Infant Formulas, Infant Formula Council, Atlanta, GA, Section C-3, (1985), (modified).

Vitamin C (by HPLC) (CALL_S) — **Food Integrity Innovation-Madison**

Fontannax, P., Kilinc, T., Heudi, O., "HPLC-UV determination of total vitamin C in a wide range of fortified food products", Food Chemistry 94: 626-631, (2006) (modified)
Capellmann, M., Bolt. H., "Simultaneous determination of ascorbic acid and dehydroascorbic acid by HPLC with postcolumn derivitization and fluorometric detection", Fresenius' Journal of Analytical Chemistry 342:462-466, (1992). (modified).
Official Methods of Analysis of AOAC International, Method 967.22, AOAC INTERNATIONAL, Gaithersburg, MD, USA (modified).

Vitamin D by LCMS (VDMS_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, Current Ed., Method 2011.11, AOAC INTERNATIONAL, Gaithersburg, MD, USA.

Huang, M., Laluzerne, P., Winters, D., Sullivan, D., "Measurement of Vitamin D in Foods and Nutritional Supplements by Liquid Chromatography/Tandem Mass Spectrometry," *Journal of AOAC International,* Volume (92). No. 5:1327-1335 (2009).

Vitamin E (LCE1_S) — **Food Integrity Innovation-Madison**

Speek, A.J., Schijver, J., and Schreurs, W.H.P., "Vitamin E Composition of Some Seed Oils as Determined by High-Performance Liquid Chromatography with Fluorometric Detection", *Journal of Food Science, 50*(1):121-124 (1985). (Modified).
Cort, W.M., Vincente, T.S., Waysek, E.H., and Williams, B.D., Vitamin E Content of Feedstuffs Determined by High-Performance Liquid Chromatographic Fluorescence", *Journal of Agricultural and Food Chemistry, 31*:1330-1333 (1983). (Modified).
McMurray, C.H., Blanchflower, W.J., and Rice, D.A., "Influence of Extraction Techniques on Determination of α-Tocopherol in Animal Feedstuffs", *Journal of the Association of Official Analytical Chemists*, *63*(6): 1258-1261 (1980). (Modified).

Vitamin K (VKTK_S) — **Food Integrity Innovation-Madison**

Official Methods of Analysis, Methods 992.27 and 999.15, AOAC International (Modified).

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Testing Location(s)	Released on Behalf of Eurofins by
Food Integ. Innovation-Greenfield Eurofins Food Chemistry Testing US, Inc. 671 S. Meridian Road Greenfield IN 46140 800-675-8375	**Karelyn Koehn - Manager** ilac-MRA A2LA ACCREDITED 2918.06
Food Integrity Innovation-Madison Eurofins Food Chemistry Testing US, Inc. 3301 Kinsman Blvd Madison WI 53704 800-675-8375	**Edward Ladwig - Director** ilac-MRA A2LA ACCREDITED 2918.01

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