

Covance Food Solutions is now Eurofins Food Integrity and Innovation

## Certificate of Analysis

### MiraKale Labs LLC

 109 N State St.  
Jackson Mississippi 39201 United States

<b>Sample Name:</b>	<b>Kale Powder</b>	<b>Eurofins Sample:</b>	<b>7747404</b>
<b>Project ID</b>	MIRAKAL_LA-20181008-0002	<b>Receipt Date</b>	08-Oct-2018
<b>PO Number</b>	CVD	<b>Receipt Condition</b>	Ambient temperature
<b>Sample Serving Size</b>		<b>Login Date</b>	08-Oct-2018

**Analysis**
**Result**
**Nutritional Label \***

Nutritional Label

See Attachment 2284722-0\_0006284429.pdf

**Caloric Calculations**

Calories	295 Cal/100g
Calories from Fat	29.1 Cal/100g
Total Carbohydrate	52.7 g/100g

**Fat by Acid Hydrolysis**

Fat	5.7 g/100g
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**Fatty Acids calculated as Triglycerides**

4:0 Butyric	<0.006 %
6:0 Caproic	<0.006 %
8:0 Caprylic	<0.006 %
10:0 Capric	<0.006 %
12:0 Lauric	<0.006 %
14:0 Myristic	0.012 %
14:1 Myristoleic	<0.006 %
15:0 Pentadecanoic	<0.006 %
15:1 Pentadecenoic	<0.006 %
16:0 Palmitic	0.467 %
16:1 Palmitoleic	<0.006 %
17:0 Heptadecanoic	0.007 %
17:1 Heptadecenoic	<0.006 %
18:0 Stearic	0.060 %
18:1 Oleic	0.046 %
Total 18:1 Isomers	0.082 %
18:2 Linoleic	0.491 %
18:3 Gamma Linolenic	<0.006 %
18:3 Alpha Linolenic	1.36 %
18:4 Octadecatetraenoic	<0.006 %
20:0 Arachidic	0.015 %
20:1 Eicosenoic	<0.006 %
20:2 Eicosadienoic	<0.006 %
20:4 Arachidonic (n6)	<0.006 %
20:4 Arachidonic (n3)	<0.006 %
20:3 Eicosatrienoic	<0.006 %

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**Analysis**
**Result**
**Fatty Acids calculated as Triglycerides**

20:3 Homogamma Linolenic	<0.006 %
20:5 Eicosapentaenoic	<0.006 %
21:5 Heneicosapentaenoic	<0.006 %
22:0 Behenic	<0.006 %
22:1 Erucic	<0.006 %
22:2 Docosadienoic	0.709 %
22:3 Docosatrienoic	<0.006 %
22:4 Docosatetraenoic	<0.006 %
22:5 Docosapentaenoic (n6)	<0.006 %
22:5 Docosapentaenoic (n3)	<0.006 %
24:0 Lignoceric	0.015 %
22:6 Docosahexaenoic	<0.006 %
24:1 Nervonic	0.009 %
Saturated Fat	0.550 %
Monounsaturated Fat, Cis and Trans Isomers	0.087 %
Polyunsaturated Fat, Cis and Trans Isomers	2.46 %
Omega 3 Fatty Acids	1.36 %
Omega 6 Fatty Acids	1.20 %
Sum of Fatty Acids	3.23 %

**Cholesterol**

Cholesterol	<1.0 mg/100g
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**Total Dietary Fiber**

Total Dietary Fiber	24.8 g/100g
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**Sugar Profile**

Fructose	3.7 g/100g
Glucose	3.8 g/100g
Sucrose	2.6 g/100g
Lactose	<0.1 g/100g
Maltose	<0.1 g/100g
Galactose	<0.1 g/100g
Total Sugar	10.1 g/100g

**Protein (N x 6.25) Dumas Method**

Protein	26.2 g/100g
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**Vitamin A from Carotenes**

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**Analysis**
**Result**
**Vitamin A from Carotenes**

Vitamin A From Carotene 12.4 mcg RAE/g

**Carotenes**

Beta Carotene 149 mcg/g

**Vitamin C**

Vitamin C 136 mg/100g

**Elements by ICP Emission Spectrometry**

Calcium 2030 mg/100g

Iron 8.14 mg/100g

Sodium 402 mg/100g

Potassium 2160 mg/100g

Copper 0.388 mg/100g

Magnesium 312 mg/100g

Manganese 2.70 mg/100g

Phosphorus 396 mg/100g

Zinc 2.57 mg/100g

**Vitamin E**

Vitamin E Natural 0.140 mg a-tocopherol/g

**Vitamin K1**

Vitamin K1 2770 mcg/100g

**Niacin by Microbiological Method**

Niacin 17.8 mg NE/100g

**Folic Acid by Microbiological Method**

Folates (may contain folic acid) 5.72 mcg DFE/g

**Tryptophan**

Tryptophan 468 mg/100g

**Ash**

Ash 10.8 g/100g

**Moisture by M100\_T100**

Moisture 7.01 g/100g

**Sterol \***

Cholesterol &lt;1.00 mg/100g

Campesterol 26.4 mg/100g

Stigmasterol 1.74 mg/100g

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Analysis	Result
<b>Sterol *</b>	
Beta Sitosterol	111 mg/100g
Brassicasterol	<1.00 mg/100g
Other Sterols/Stanol	37.7 mg/100g
Total Sterols	177 mg/100g
<b>Iodine by ICP-MS</b>	
Iodine	<40.0 mcg/100g
<b>Selenium *</b>	
Selenium	8.53 mcg/100g

Method References	Testing Location
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<b>Ash (ASHM_S)</b> Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 923.03, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)	<b>Food Integrity Innovation-Madison</b>
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<b>Caloric Calculations (CALC_S)</b> United States Department of Agriculture, "Energy Value of Foods," Agriculture Handbook No. 74, pp 2-11 (1973).  Code of Federal Regulation, Title 21, Part 101.9, pp. 24-25	<b>Food Integrity Innovation-Madison</b>
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<b>Carotenes (CAR1_S)</b> 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," <i>Journal of Liquid Chromatography</i> , 10: 643-653 (1987) (modified).	<b>Food Integrity Innovation-Madison</b>
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<b>Cholesterol (CHOK_S)</b> Official Methods of Analysis of AOAC INTERNATIONAL 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA,(2005), Official Method 994.10. (Modified)	<b>Food Integrity Innovation-Madison</b>
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<b>Elements by ICP Emission Spectrometry (ICP_S)</b> Official Methods of Analysis of AOAC INTERNATIONAL, Method 984.27, 985.01, and 2011.14, AOAC INTERNATIONAL, Gaithersburg, MD, USA. (Modified)	<b>Food Integrity Innovation-Madison</b>
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Method References	Testing Location
<p><b>Fat by Acid Hydrolysis (FAT_AH_S)</b></p> <p><b>Food Products that are not Dairy, Egg or Cheese Products</b> Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 922.06 and 954.02, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)</p> <p><b>Cheese and Cheese Products</b> Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 933.05. (Modified)</p> <p><b>Egg, Egg Products, and Mayonnaise</b> Official Methods of Analysis of AOAC INTERNATIONAL (2005) 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 925.32. (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Fatty Acids calculated as Triglycerides (FALC_S)</b></p> <p>Official Methods and Recommended Practices of the AOCS, Official methods Ce 2b-11 (2011), Ce 1i-07, Ce 2-66 (2009), The American Oil Chemists' Society, Champaign, IL (modified).</p>	Food Integrity Innovation-Madison
<p><b>Folic Acid by Microbiological Method (FOAN_S)</b></p> <p><i>Official Methods of Analysis of AOAC INTERNATIONAL</i>, Method 992.05 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD, USA (Modified).</p> <p>“Methods of Analysis for Infant Formulas,” Infant Formula Council, Atlanta, GA, Section C-2 (1985) (Modified).</p>	Food Integrity Innovation-Madison
<p><b>Iodine by ICP-MS (IODICPMS_S)</b></p> <p>Official Methods of Analysis of AOAC INTERNATIONAL, Current Ed., Method 2012.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA.</p>	Food Integrity Innovation-Madison
<p><b>Moisture by M100_T100 (M100T100_S)</b></p> <p>Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 925.09 and 926.08, AOAC INTERNATIONAL, Gaithersburg, MD, USA,(2005). (Modified).</p>	Food Integrity Innovation-Madison
<p><b>Niacin by Microbiological Method (NIAP_S)</b></p> <p><i>Official Methods of Analysis</i>, Methods 944.13 and 960.46, AOAC INTERNATIONAL, Gaithersburg, MD (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Nutritional Label (LABEL)</b></p> <p><b>Food Labeling: Revision of the Nutrition and Supplement Facts Labels, Federal Register, Vol. 81, No. 103, May 27, 2016</b></p>	Food Integrity Innovation-Livermore

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Method References	Testing Location
<p><b>Protein (N x 6.25) Dumas Method (DGEN_S)</b></p> <p>Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Methods 968.06 and 992.15, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Selenium (SEICPMS_S)</b></p> <p>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).</p> <p>Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., AOAC INTERNATIONAL, Gaithersburg, MD, USA, Official Method 2011.19 (2011). (Modified).</p>	Food Integrity Innovation-Madison
<p><b>Sterol (STOL_S)</b></p> <p>Official Methods of Analysis, Method 2007.03, AOAC INTERNATIONAL, Gaithersburg, MD, (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Sugar Profile (SUGN_S)</b></p> <p>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)</p> <p>Brobst, K. M., "Gas-Liquid Chromatography of Trimethylsilyl Derivatives, Methods in Carbohydrate Chemistry," 6:3-8, Academic Press, New York, NY, (1972). (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Total Dietary Fiber (TDFL_S)</b></p> <p>Official Methods of Analysis of AOAC INTERNATIONAL 18th Ed., Method 991.43, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)</p>	Food Integrity Innovation-Madison
<p><b>Tryptophan (TRPLC_S)</b></p> <p>Official Methods of Analysis of AOAC INTERNATIONAL, AOAC International Gaithersburg, MD, USA, Official Method 988.15.</p> <p>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.</p> <p>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.</p> <p>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).</p>	Food Integrity Innovation-Madison

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Method References	Testing Location
<b>Vitamin A from Carotenes (BCAV_S)</b> Calculation on request.	Food Integrity Innovation-Madison
<b>Vitamin C (VCF_S)</b> Official Methods of Analysis of AOAC INTERNATIONAL, 18th Ed., Method 967.22, AOAC INTERNATIONAL, Gaithersburg, MD, USA, (2005). (Modified)	Food Integrity Innovation-Madison
<b>Vitamin E (LCE1_S)</b> 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", <i>Journal of Food Science</i> , 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", <i>Journal of Agricultural and Food Chemistry</i> , 31:1330-1333 (1983). (Modified). McMurray, C.H., Blanchflower, W.J., and Rice, D.A., "Influence of Extraction Techniques on Determination of $\alpha$ -Tocopherol in Animal Feedstuffs", <i>Journal of the Association of Official Analytical Chemists</i> , 63(6): 1258-1261 (1980). (Modified).	Food Integrity Innovation-Madison
<b>Vitamin K1 (VKTK_S)</b> Official Methods of Analysis, Methods 992.27, 999.15, AOAC International (Modified).	Food Integrity Innovation-Madison

Testing Location(s)	Released on Behalf of Eurofins by
<b>Food Integrity Innovation-Livermore</b> Eurofins Food Chemistry Testing US, Inc. 365 N. Canyons Parkway Suite 201 Livermore CA 94551 800-675-8375	Kristopher Moore - Manager
<b>Food Integrity Innovation-Madison</b> Eurofins Food Chemistry Testing US, Inc. 3301 Kinsman Blvd Madison WI 53704 800-675-8375	Edward Ladwig - Director 

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