REPORT NUMBER
15-258-4038 v2

REPORT DATE
Sep 15, 2015

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20595

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Sep 03, 2015

Midwest Laboratories, Inc.®
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ISSUE DATE
Sep 15, 2015

GREEN PASTURES
DAVE WETZEL
BOX 486
ONEILL NE 68763

REPORT OF ANALYSIS

For: (20595) GREEN PASTURES
FERMENTED COD LIVER OIL
C14061815

Analysis	Level Found As Received	Units	Reporting Limit	Method	Analyst-Date	Verified-Date
Sample ID: **C14061815** Lab Number: **2440465**						
Butyric (C4:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Caproic (C6:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Caprylic (C8:0)	0.01	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Capric (C10:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Lauric (C12:0)	0.04	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Tridecanoic (C13:0)	0.01	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Myristic (C14:0)	3.63	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Myristoledic (C14:1 Trans)	0.06	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Myristoleic (C14:1 Cis)	0.11	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Pentadecanoic (C15:0)	0.31	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitic (C16:0)	11.7	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitelaidic (C16:1 Trans)	0.37	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitoleic (C16:1 Cis)	12.9	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Heptadecanoic (C17:0)	0.167	%	0.010	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
10-Heptadecanoic (C17:1)	0.41	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Stearic (C18:0)	3.15	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Eliadic (C18:1 Trans)	1.19	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Oleic (C18:1 Cis)	30.2	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Linolelaidic (C18:2 Trans)	0.05	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11

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Linoleic (C18:2 Cis)	0.95	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
gamma-Linolenic (C18:3 gamma)	0.13	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Nonadecanoic (C19:0)	0.02	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
alpha-Linolenic (C18:3 alpha)	0.51	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Arachidic (C20:0)	0.07	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-Eicosenoic (C20:1)	3.87	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-14 Eicosadienoic (C20:2)	0.33	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Homo-gamma linolenic (C20:3)	0.13	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-14-17 Eicosatrienoic (C20:3)	0.11	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Arachidonic (C20:4)	0.80	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Eicosapentaenoic (C20:5)	15.3	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Heneicosanoic (C21:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Behenic (C22:0)	0.02	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Erucic (C22:1)	0.48	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosadienoic (C22:2)	0.06	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosapentaenoic (C22:5)	1.71	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosahexaenoic (C22:6)	10.8	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Tricosanoic (C23:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Lignoceric (C24:0)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11

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Sample ID: C14061815 Lab Number: **2440465** (con't)						
Nervonic (C24:1)	0.39	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Saturated fat (total)	19.2	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Polyunsaturated fats (total)	30.8	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Monounsaturated fats (total)	48.4	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Trans fatty acids (total)	1.61	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Omega 3 fatty acids (total)	28.4	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Omega 6 fatty acids (total)	2.27	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Omega 9 fatty acids (total)	30.7	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Peroxide value	4.9	meq/kg fat	2.0	AOCS Cd 8b-90 *	bch0-2015/09/14	ems4-2015/09/14
Fat (acid hydrolysis)	100	%	0.1	AOAC 922.06 (mod) *	ems4-2015/09/08	ems4-2015/09/08
p-anisidine value	n.d.		2	AOCS Cd 18-90 *	nmk6-2015/09/08	ems4-2015/09/08
TBA value	0.26	mg/kg	0.02	J. FOOD SCI	mnp3-2015/09/11	ems4-2015/09/11
Free fatty acid	17.13	%/crude fat	0.01	AOCS 5a 40 *	dtd7-2015/09/11	ems4-2015/09/11

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Analysis	Level Found As Received	Units	Reporting Limit	Method	Analyst-Date	Verified-Date

This report was reissued on 2015-09-15 13:53:17 by lmh7 for the following reason:
Added PO Number.
All results are reported on an AS RECEIVED basis., n.d. = not detected , ppm = parts per million, ppm = mg/kg

For questions please contact:

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Account Manager
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Detailed Method Description(s)

Fatty Acid Profile

Sample prep follows MWL HPLC 008 and analysis follows HPLC 004 which are both based on AOAC 996.06. The fat in the sample is extracted and saponified and the fatty acids methylated to form the fatty acid methyl esters (FAMEs). The methyl ester extract (FAMEs) is injected into a GC that uses a flame ionization detector (GC/FID). The response generated during analyses of the individual FAME is compared to standards which are used to quantitate the levels of fatty acids found in the sample. The standard reporting level is 0.01% of the fat.

Fat (acid hydrolysis)

Analysis follows MWL FO 08 which is based on AOAC 922.06. The homogenized sample is treated with hydrochloric acid and then washed at least twice with both petroleum ether and diethyl ether and the solution placed in a pre-weighed container. The ether solution, which contains the dissolved fat, is evaporated and the percent fat determined by the weight gain of the beaker.

Peroxide value

Peroxide value analysis is carried out using FO 033 which is based on AOAC 965.33 and AOCS Cd 8b-90. Samples are treated with a solvent that removes the fat and the fat-solvent solution treated with potassium iodide. The solution is titrated with sodium thiosulfate to measure the free iodide. A calculation is carried out to measure the peroxide value.

Anisidine value

Anal;ysis follows MWL FO 063 which is based on modified AOCS Cd 18-90. The fat in a sample is extracted and then dissolved into iso-octane. The p-anisidine reagent is added and the resultant solution read at 350 nm.

Free fatty acids (foods)

Analysis follows MWL FO 032 which is based on AOCS 5a-40. Fat samples are weighed and placed in a container with 50 mL of neutralized alcohol and then titrated to pink end-point using standard (0.1N) sodium hydroxide. The mLs of titrant is entered into a calculation to determine free fatty acids as a percent of total fat.

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