

**GREEN PASTURES  
DAVE WETZEL  
BOX 486  
ONEILL NE 68763**

**REPORT OF ANALYSIS**

For: (20595) GREEN PASTURES  
FERMENTED COD LIVER OIL  
C15061815

Analysis	Level Found	Units	Reporting		Analyst- Date	Verified- Date
	As Received		Limit	Method		
Sample ID: <b>C15061815</b> Lab Number: <b>2440466</b>						
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)	3.83	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Myristoleic (C14:1 Trans)	0.05	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Myristoleic (C14:1 Cis)	0.12	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Pentadecanoic (C15:0)	0.32	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitic (C16:0)	11.9	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitelaidic (C16:1 Trans)	0.38	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Palmitoleic (C16:1 Cis)	12.0	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Heptadecanoic (C17:0)	0.174	%	0.010	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
10-Heptadecanoic (C17:1)	0.40	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Stearic (C18:0)	3.18	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Eliadic (C18:1 Trans)	1.59	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Oleic (C18:1 Cis)	29.4	%	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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	As Received		Limit			
<b>Sample ID: C15061815</b>	Lab Number: <b>2440466</b> (con't)					
Linoleic (C18:2 Cis)	0.97	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
gamma-Linolenic (C18:3 gamma)	0.12	%	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)	0.55	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Arachidic (C20:0)	0.08	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-Eicosenoic (C20:1)	4.58	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-14 Eicosadienoic (C20:2)	0.37	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Homo-gamma linolenic (C20:3)	0.12	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
11-14-17 Eicosatrienoic (C20:3)	0.12	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Arachidonic (C20:4)	0.84	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Eicosapentaenoic (C20:5)	14.4	%	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)	0.54	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosadienoic (C22:2)	n.d.	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosapentaenoic (C22:5)	1.85	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Docosahexaenoic (C22:6)	11.5	%	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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C15061815

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	As Received		Limit	Method		
<b>Sample ID: C15061815</b>	Lab Number: <b>2440466</b> (con't)					
Nervonic (C24:1)	0.45	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Saturated fat (total)	19.6	%	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)	47.5	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Trans fatty acids (total)	2.01	%	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)	2.29	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Omega 9 fatty acids (total)	30.0	%	0.01	AOAC 996.06 *	amw7-2015/09/10	tjp8-2015/09/11
Peroxide value	4.8	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	4		2	AOCS Cd 18-90 *	nmk6-2015/09/08	ems4-2015/09/08
TBA value	0.61	mg/kg	0.02	J. FOOD SCI	mnp3-2015/09/11	ems4-2015/09/11
Free fatty acid	15.53	%/crude fat	0.01	AOCS 5a 40 *	dttd7-2015/09/11	ems4-2015/09/11

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REPORT NUMBER

**15-258-4039 v2**

REPORT DATE  
**Sep 15, 2015**  
RECEIVED DATE  
**Sep 03, 2015**

SEND TO  
**20595**



13611 "B" Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121  
www.midwestlabs.com

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ISSUE DATE  
**Sep 15, 2015**

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C15061815

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

This report was reissued on 2015-09-15 13:53:30 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:

Sue Ann Seitz  
Account Manager  
sueann.seitz@midwestlabs.com (402)829-9892

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BOX 486  
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FERMENTED COD LIVER OIL  
C15061815****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**

Analysis 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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