

Lipid Standards

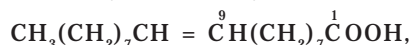
Fatty Acid Methyl Esters (FAMES)

A Word on Nomenclature - Common names are used in this catalog where brevity does not sacrifice clarity. Geneva names are used where possible.

Saturated and unsaturated fatty acids are named according to the number of carbon atoms of the parent hydrocarbon chain. Saturated fatty acids are named according to the modified Geneva system, by replacing the terminal "e" of the parent hydrocarbon with the suffix "oic" (e.g., decane to decanoic). The common names of most of these fatty acids are also listed.

Unsaturated fatty acids are named by replacing the "e" of the corresponding unsaturated hydrocarbon with the suffix "oic" (e.g., decene to decenoic). The number of multiple double bonds is indicated by adding dienoic, and so on to the hydrocarbon name. For example, the 18 carbon chain acid with three double bonds is named octadecatrienoic.

Double bonds are also designated by position and geometric configuration. Naturally occurring fatty acids are usually of the *cis* configuration, unless stated as *trans*. Octadecenoic acid with the double bond in the nine position has both *cis* (common name, oleic acid) and *trans* (elaidic acid) forms. The simplest way to name double-bond positions is to count carbons, starting with the carboxyl carbon, until you reach the double bond. Thus, oleic acid named by the Geneva system is *cis*-9-octadecenoic acid:



and linoleic acid is *cis*-9,12-octadecadienoic acid:



In the product descriptions for lipid mixes, chain length, followed by the number of double bonds, is indicated in parentheses after the component names. For example, linolenic acid, which has a chain length of 18 and 3 double bonds, is listed as:

Linolenic acid (18:3)

C18 FAME Isomer Mix

MIX	COMPONENTS	WT. %	QTY.	CAT. NO.
Linoleic Acid Methyl Ester <i>cis/trans</i> Isomer Mix	4 components, 10mg/mL in methylene chloride		1mL	47791
	trans-9,trans-12-Octadecadienoic acid methyl ester	50		
	<i>cis</i> -9,trans-12-Octadecadienoic acid methyl ester	20		
	trans-9, <i>cis</i> -12-Octadecadienoic acid methyl ester	20		
	<i>cis</i> -9, <i>cis</i> -12-Octadecadienoic acid methyl ester	10		

C18 *cis/trans* Fatty Acids/FAMES

10mg/mL in heptane.

DESCRIPTION	CAS NO.	QTY.	CAT. NO.
<i>cis</i> -6-Octadecenoic methyl ester (Petroselinic)	2777-58-4	1mL	47198
trans-6-Octadecenoic methyl ester (Petroselaidic)	-	1mL	47199
<i>cis</i> -7-Octadecenoic methyl ester	2278-59-3	1mL	46900-U
<i>cis</i> -9-Octadecenoic methyl ester (Oleic)	112-62-9	1mL	46902-U
trans-9-Octadecenoic methyl ester (Elaidic)	2462-84-2	1mL	46903
<i>cis</i> -11-Octadecenoic methyl ester (<i>cis</i> -Vaccenic)	1937-63-9	1mL	46904
trans-11-Octadecenoic methyl ester (trans-Vaccenic)	6198-58-9	1mL	46905-U
<i>cis</i> -12-Octadecenoic methyl ester	2733-86-0	1mL	46906
trans-12-Octadecenoic methyl ester	20221-23-2	1mL	46907-U
trans-13-Octadecenoic methyl ester	42199-38-2	1mL	46909
<i>cis</i> -15-Octadecenoic methyl ester	10411-39-9	1mL	46953
<i>cis</i> -9,12-Octadecadienoic methyl ester	112-63-0	1mL	46950-U
trans-9,12-Octadecadienoic methyl ester	2566-97-4	1mL	46951-U
<i>cis</i> -5,8,11,14,17-Eicosapentaenoic methyl ester	2734-47-6	1mL	47571-U
<i>cis</i> -4,7,10,13,16,19-Docosahexaenoic methyl ester	301-01-9	1mL	47570-U
<i>cis</i> -7,10,13,16,19-Docosapentaenoic methyl ester	108698-02-8	1mL	47563-U

Highly Characterized Reference Oils

We offer highly characterized common reference oil samples for use as controls or check samples for fatty acid methyl ester (FAME) analyses. These samples provide an excellent means of standardizing your lipid procedures and comparing your results to others. A Certificate of Analysis is provided with each oil sample.

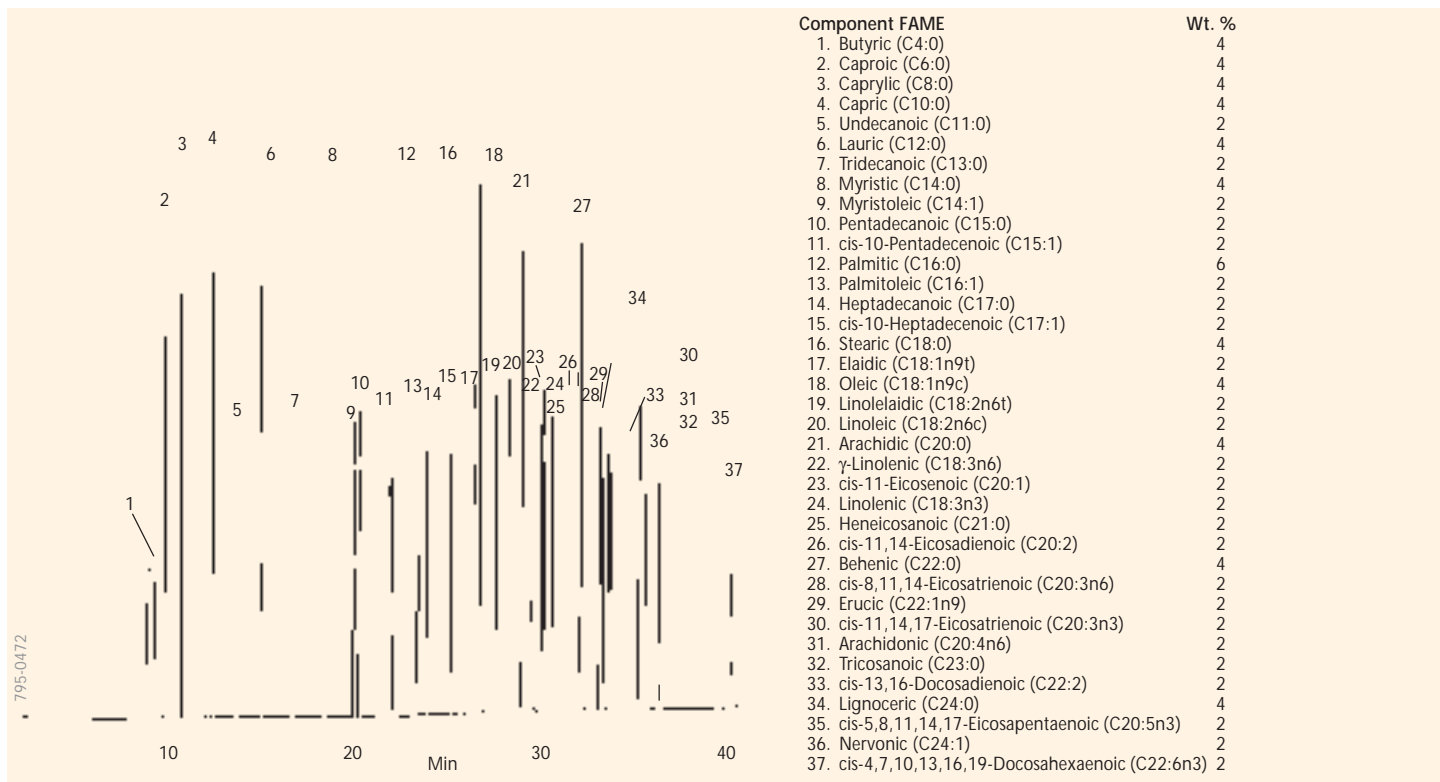
1g, packed in amber ampul under nitrogen.

DESCRIPTION	CAS NO.	WT.	CAT. NO.
Canola oil	120962-03-0	1g	46961
Coconut oil	8001-31-8	1g	46949
Corn oil	8001-30-7	1g	47112-U
Cottonseed oil	8001-29-4	1g	47113
Flaxseed oil	8001-26-1	1g	47559-U
Lard oil	8016-28-2	1g	47115-U
Menhaden fish oil	8002-50-4	1g	47116
Menhaden fish oil, partially hydrogenated (PHMO)	—	1g	47117
Olive oil – refined	8001-25-0	1g	47118
Palm oil	8002-75-3	1g	46962
Peanut oil	8002-03-7	1g	47119
Safflower oil	8001-23-8	1g	47120-U
Soybean oil	8001-22-7	1g	47122
Sunflower seed oil	8001-21-6	1g	47123

Supelco 37 Component FAME Mix

This fatty acid methyl ester (FAME) reference standard is carefully prepared by weight. The weight percentage of each component is indicated. Each ampul contains 10mg/mL of the FAME reference standard mix in methylene chloride.

DESCRIPTION	QTY.	CAT. NO.
Supelco 37 Component FAME Mix	1mL	47885-U



Column: SP-2560, 100m x 0.25mm ID, 0.20µm film

Cat. No.: 24056

Oven: 140°C (5 min) to 240°C at 4°C/min

Carrier: helium, 20cm/sec

Det.: FID, 260°C

Inj.: 1µL Cat. No. 47885-U, split 100:1, 260°C

AOCS Animal and Vegetable Reference Mixes

The quantitative mixes listed here conform to the requirements of American Oil Chemists' Society (AOCS) Method Ce 1-62. The composition of each mix is similar to the fatty acid distribution of certain oils (see Table 1).

RM-1 – Corn, cottonseed, kapok, poppyseed, rice, safflower, sesame, soybean, sunflower, and walnut oils

RM-2 – Hempseed, linseed, perilla, and rubberseed oils

RM-3 – Mustard seed, peanut, and rapeseed oils

Rapeseed Oil Reference Mix – Modern low erucic acid oils

RM-4 – Neatsfoot, olive, and teaseed oils

RM-5 – Babassu, coconut, ouri-curi, and palm kernel oils

RM-6 – Lard, beef tallow, mutton tallow, and palm oil

NHI/NIH Fatty Acid Methyl Ester Reference Mixes

Quantitative standards, identical in composition to those developed and distributed for several years by the National Institutes of Health (Horning, E.C., *et al.*, *J. Lipid Research*, 5:20-27, 1964). Each mix (see Table 1) was designed to test part of the chromatographic system to ensure its reliability for quantitative analyses.

GLC Standard Mixes

These quantitative mixes are useful for determining relative retention times and approximating response factors.

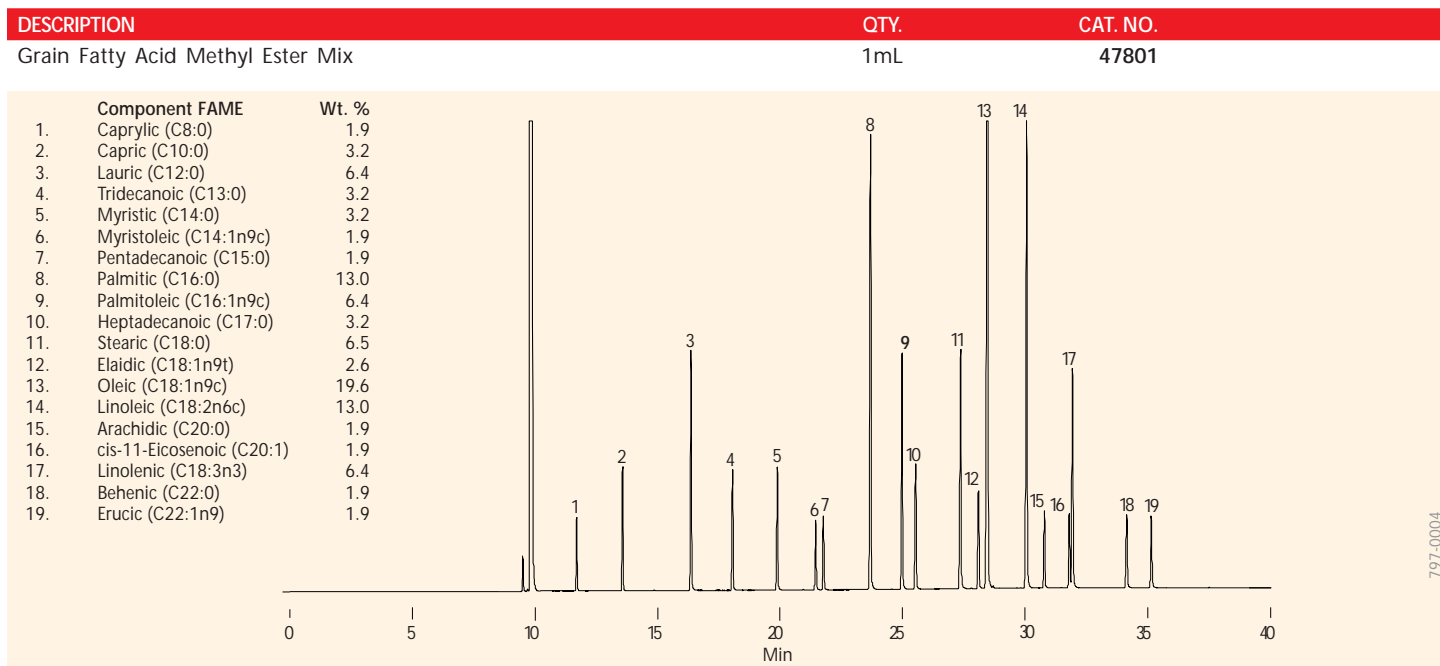
Table 1. Specifications for Quantitative Products
Each mix is carefully prepared by weight percent.

MIX	CAT. NO.	METHYL ESTER (% COMPOSITION BY WEIGHT)																						
		C8:0 (caprylate)	C9:0 (nonanoate)	C10:0 (caprate)	C11:0 (undecanoate)	C12:0 (laurate)	C13:0 (tridecanoate)	C14:0 (myristate)	C15:0 (pentadecanoate)	C16:0 (palmitate)	C16:1 (palmitoleate)	C17:0 (heptadecanoate)	C18:0 (stearate)	C18:1 (oleate)	C18:2 (linoleate)	C18:3 (linolenate)**	C19:0 (nonadecanoate)	C20:0 (arachidate)	C20:1 (eicosenoate)	C21:0 (heneicosanoate)	C22:0 (behenate)	C22:1 (erucate)	C24:0 (lignocerate)	
Qty.: 100mg each, neat Storage Temp.: -0 C																								
RM-1	O7006-1AMP								6.0			3.0	35.0	50.0	3.0		3.0							
RM-2	O7131-1AMP								7.0			5.0	18.0	36.0	34.0									
RM-3	O7256-1AMP							1.0	4.0			3.0	45.0	15.0	3.0		3.0				3.0	20.0	3.0	
Rapeseed	O7756-1AMP							1.0	4.0			3.0	60.0	12.0	5.0		3.0	1.0			3.0	5.0	3.0	
RM-4	O7381-1AMP									11.0		3.0	80.0	6.0										
RM-5	O7506-1AMP	7.0		5.0		48.0		15.0		7.0		3.0	12.0	3.0										
RM-6	O7631-1AMP							2.0	30.0	3.0		14.0	41.0	7.0	3.0									
NHI-C	O8256-1AMP	1.5		3.0		6.0		12.0		19.4		24.9					33.2							
NHI-D	O8381-1AMP							11.8		23.6	6.9	13.1	44.6											
NHI-F	O8631-1AMP							2.5		4.2		7.3					13.6				25.4		47.0	
NHI-A	O7881-1AMP							25.0		10.0		65.0												
NHI-B	O8131-1AMP							4.0		40.0		56.0												
NHI-E	O8506-1AMP	6.3		9.1		12.1		23.3		49.2														
GLC-10	1891-1AMP									20.0		20.0	20.0	20.0	20.0									
GLC-20	1892-1AMP									20.0		20.0	20.0		20.0		20.0							
GLC-30	1893-1AMP	20.0		20.0		20.0		20.0		20.0														
GLC-40	1895-1AMP									25.0		25.0					25.0				25.0			
GLC-50	1894-1AMP										25.0		25.0					25.0				25.0		
GLC-70	1897-1AMP	20.0	20.0	20.0	20.0	20.0																		
GLC-80	1898-1AMP							20.0	20.0	20.0	20.0		20.0											
GLC-90	1896-1AMP							20.0		20.0		20.0					20.0				20.0			
GLC-100	1899-1AMP											20.0					20.0	20.0			20.0	20.0		

**Stability problems arise with international shipment of mixtures containing linolenate. When ordering such mixtures from outside the continental US or central Europe, please check with your local dealer regarding ordering practices.

Grain Fatty Acid Methyl Ester Mix

This fatty acid methyl ester (FAME) mixture is carefully prepared by weight. The weight percentage of each component is indicated. Each ampul contains 10mg/mL of the FAME reference standard mix in methylene chloride.



Column: SP-2560, 100m x 0.25mm ID, 0.20µm film
 Cat. No.: 24056
 Oven: 140°C (5 min) to 240°C at 4°C/min
 Carrier: helium, 20cm/sec
 Det.: FID, 260°C
 Inj.: 1µL, 260°C, split 100:1

Polyunsaturated Fatty Acid (PUFA) Methyl Esters

These are complex qualitative standard mixtures. Because they are extracted from natural materials, relative peak sizes and composition may vary from lot to lot.

DESCRIPTION	QTY.	CAT. NO.
PUFA NO. 1		
Marine Source	100mg	47033
<i>Typically contains each FAME listed</i>		
C14:0	C18:2 ω6	C22:1 ω9
C16:0	C18:4 ω3	C22:5 ω3
C16:1 ω7	C20:1 ω9	C22:6 ω3
C18:1 ω9	C20:5 ω3	
C18:1 ω7	C22:1 ω11	
PUFA NO. 2		
Animal Source	100mg	47015-U
<i>Typically contains each FAME listed</i>		
C14:0	C18:1 ω7	C20:4 ω6
C16:0	C18:2 ω6	C20:5 ω3
C16:1 ω7	C18:3 ω6	C22:4 ω6
C18:0	C18:3 ω3	C22:5 ω3
C18:1 ω9	C20:3 ω6	C22:6 ω3
PUFA NO. 3		
From Menhaden Oil	100mg	47085-U
<i>Typically contains each FAME listed</i>		
C14:0	C18:1 ω7	C20:1 ω9
C16:0	C18:2 ω6	C20:4 ω6
C16:1 ω7	C18:2 ω4	C20:4 ω3
C16:2 ω4	C18:3 ω4	C20:5 ω3
C16:4 ω1	C18:3 ω3	C22:5 ω3
C18:0	C18:4 ω3	C22:6 ω3
C18:1 ω9		

Note: In the ω-x classification, carbon atoms are numbered from the terminal methyl group to the first carbon of the ethylenic bond.
 X denotes the position at the double bond closest to the terminal methyl group.

Qualitative Methyl Ester Mixes

These mixes are prepared from unsaturated medium-chain fatty acids. They are useful for establishing retention times and for peak identification. All components are 99% pure by GLC and/or TLC, unless otherwise stated.

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
SATURATED FAMES			
Fatty Acid Methyl Esters, Saturated Straight Chains Kit	<i>10 individually packaged FAMES, each 1g</i> Caproic (6:0) Caprylic (8:0) Capric (10:0) Lauric (12:0) Myristic (14:0) Palmitic (16:0) Stearic (18:0) Arachidic (20:0) Behenic (22:0) Lignoceric (24:0)		ME10-1KT
Fatty Acid Methyl Esters, Saturated Straight Chains Kit	<i>19 individually packaged FAMES, each 1g</i> Caproic (6:0) Heptanoic (7:0) Caprylic (8:0) Nonanoic (9:0) Capric (10:0) Undecanoic (11:0) Lauric (12:0) Tridecanoic (13:0) Myristic (14:0) Pentadecanoic (15:0) Palmitic (16:0) Heptadecanoic (17:0) Stearic (18:0) Nonadecanoic (19:0) Arachidic (20:0) Heneicosanoic (21:0) Behenic (22:0) Tricosanoic (23:0) Lignoceric (24:0)		ME19-1KT
Fatty Acid Methyl Esters, Saturated Straight Chains Kit	<i>7 individually packaged FAMES, each 100mg</i> Pentacosanoic (25:0) Hexacosanoic (26:0) Heptacosanoic (27:0) Octacosanoic (28:0) Nonacosanoic (29:0) Triacontanoic (30:0) Hentriacontanoic (31:0), approx. 98% pure		ME7-1KT
UNSATURATED FAMES			
Fatty Acid Methyl Esters, Unsaturated Kit	<i>14 individually packaged FAMES in the amounts indicated</i> Myristoleic (14:1), 100mg Palmitoleic (16:1), 100mg Petroselinic (18:1), 100mg Oleic (18:1), 1g Elaidic (18:1), 500mg cis-Vaccenic (18:1, cis), 100mg Linoleic (18:2), 1g Linolelaidic (18:2), 100mg Linolenic (18:3, trans), 100mg cis-11-Eicosenoic (20:1), 100mg Arachidonic (20:4), 100mg Erucic (22:1), 100mg cis-4,7,10,13,16,19-Docosahexaenoic (22:6), 100mg Nervonic (24:1), 100mg		ME14-1KT
Fatty Acid Methyl Ester Mix	<i>4 components, approx. 10mg each</i> 11-Eicosenoic (20:1) 11,14-Eicosadienoic (20:2) (98% pure) Arachidonic (20:4) 5,8,11,14,17-Eicosapentaenoic (20:5)	40mg	18912-1AMP
Fatty Acid Methyl Ester Mix	<i>5 components, approx. 10mg each</i> 11-Eicosenoic (20:1) 11,14-Eicosadienoic (20:2) (98% pure) 11,14,17-Eicosatriaenoic (20:3) (97-99% pure) Arachidonic (20:4) 5,8,11,14,17-Eicosapentaenoic (20:5)	50mg	18913-1AMP

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
UNSATURATED FAMES (CONTD.)			
Fatty Acid Methyl Ester Mix	<i>6 components, total of 100mg neat mixture weight percentages indicated</i> Stearic acid m.e. (C18:0), 10% Oleic acid m.e. (C18:1, cis-9), 20% Elaidic acid m.e. (C18:1, trans-9), 20%	100mg	18916-1AMP
	Linoleic acid m.e. (C18:2 cis-9,12), 20% Linolelaidic acid m.e. (C18:2, trans-9,12), 20% Arachidic acid m.e. (C20:0), 10%		
Fatty Acid Methyl Ester Mix	<i>10 components, total of 100mg neat mixture weight percentages indicated</i> Myristic acid m.e. (C14:0), 4% Palmitic acid m.e. (C16:0), 10% Stearic acid m.e. (C18:0), 6% Oleic acid m.e. (C18:1, cis-9), 25% Elaidic acid m.e. (C18:1, trans-9), 10%	100mg	18917-1AMP
	Linoleic acid m.e. (C18:2 cis-9,12), 34% Linolelaidic acid m.e. (C18:2, trans-9,12), 2% Linolenic acid m.e. (C18:3, cis-9,12,15), 5% Arachidic acid m.e. (C20:0), 2% Behenic acid m.e. (C22:0), 2%		
Fatty Acid Methyl Ester Mix R: 36/37/38 S: 26-36	<i>14 components, total of 100mg neat mixture weight percentages indicated</i> Caprylic acid m.e. (C8:0), 8% Capric acid m.e. (C10:0), 8% Lauric acid m.e. (C12:0), 8% Myristic acid m.e. (C14:0), 8% Palmitic acid m.e. (C16:0), 11% Palmitoleic acid m.e. (C16:1, cis-9), 5% Stearic acid m.e. (C18:0), 8%	100mg	18918-1AMP
	Oleic acid m.e. (C18:1, cis-9), 5% Linoleic acid m.e. (C18:2 cis-9,12), 5% Linolenic acid m.e. (C18:3, cis-9,12,15), 5% Arachidic acid m.e. (C20:0), 8% Behenic acid m.e. (C22:0), 8% Erucic acid m.e. (C22:1, cis-13), 5% Lignoceric acid m.e. (C24:0), 8%		
Fatty Acid Methyl Ester Mix R: 36/37/038 S: 26-36	<i>37 components, total of 100mg neat mixture weight percentages indicated</i> Butyric acid m.e. (C4:0), 4% Caproic acid m.e. (C6:0), 4% Caprylic acid m.e. (C8:0), 4% Capric acid m.e. (C10:0), 4% Undecanoic acid m.e. (C11:0), 2% Lauric acid m.e. (C12:0), 4% Tridecanoic acid m.e. (C13:0), 2% Myristic acid m.e. (C14:0), 4% Myristoleic acid m.e. (C14:0, cis-9), 2% Pentadecanoic acid m.e. (C15:0), 2% cis-10 Pentadecenoic acid m.e. (C15:1) (approx. 98%), 2% Palmitic acid m.e. (C16:0), 6% Palmitoleic acid m.e. (C16:1, cis-9), 2% Heptadecanoic acid m.e. (C17:0), 2% cis-10 Heptadecenoic acid m.e. (C17:1), 2% Stearic acid m.e. (C18:0), 4% Oleic acid m.e. (C18:1, cis-9), 4% Elaidic acid m.e. (C18:1, trans-9), 2%	100mg	18919-1AMP
	Linoleic acid m.e. (C18:2 cis-9,12), 2% Linolelaidic acid m.e. (C18:2, trans-9,12), 2% Linolenic acid m.e. (C18:3, cis-9,12,15), 2% g-Linolenic acid m.e. (C18:3, cis-6,9,12), 2% Arachidic acid m.e. (C20:0), 4% cis-11-Eicosenoic acid m.e. (C20:1), 2% cis-11,14-Eicosadienoic acid m.e. (C20:2), (98%), 2% cis-11,14,17-Eicosatrienoic acid m.e. (C20:3) (97-99%), 2% cis-8,11,14-Eicosatrienoic acid m.e. (C20:3), 2% Arachidonic acid m.e. (C20:4, cis-5,8,11,14), 2% cis-5,8,11,14,17-Eicosapentaenoic acid m.e. (C20:5), 2% Heneicosanoic acid m.e. (C21:0), 2% Behenic acid m.e. (C22:0), 4% Erucic acid m.e. (C22:1, cis-13), 2% cis-13,16-Docosadienoic acid m.e. (C22:2), 2% cis-4,7,10,13,16,19-Docosahexaenoic acid m.e. (C22:6), 2% Tricosanoic acid m.e. (C23:0), 2% Lignoceric acid m.e. (C24:0), 4% Nervonic acid m.e. (C24:1, cis-15), 2%		
Fatty Acid Methyl Ester Mix	<i>19 components, total of 100mg neat mixture weight percentages indicated</i> Caprylic acid m.e. (C8:0), 1.9% Capric acid m.e. (C10:0), 3.2% Lauric acid m.e. (C12:0), 6.4% Tridecanoic acid m.e. (C13:0), 3.2% Myristic acid m.e. (C14:0), 3.2% Myristoleic acid m.e. (C14:0, cis-9), 1.9% Pentadecanoic acid m.e. (C15:0), 1.9% Palmitic acid m.e. (C16:0), 13.0% Palmitoleic acid m.e. (C16:1, cis-9), 6.4% Heptadecanoic acid m.e. (C17:0), 3.2%	100mg	18920-1AMP
	Stearic acid m.e. (C18:0), 6.5% Oleic acid m.e. (C18:1, cis-9), 19.6% Elaidic acid m.e. (C18:1, trans-9), 2.6% Linoleic acid m.e. (C18:2 cis-9,12), 13.0% Linolenic acid m.e. (C18:3, cis-9,12,15), 6.4% Arachidic acid m.e. (C20:0), 1.9% cis-11-Eicosenoic acid m.e. (C20:1), 1.9% Behenic acid m.e. (C22:0), 1.9% Erucic acid m.e. (C22:1, cis-13), 1.9%		

Qualitative Fatty Acid Mixes

These mixes are prepared from unsaturated medium-chain fatty acids. They are useful for establishing retention times and for peak identification. All components are 99% pure by GLC and/or TLC, unless otherwise stated.

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
SATURATED FATTY ACIDS			
Fatty Acids, Even Carbon Straight Chains Kit	<i>10 individually packaged fatty acids in the amounts indicated</i> Caproic acid (C6:0), 10mL Caprylic acid (C8:0), 10mL Capric acid (C10:0), 10g Lauric acid (C12:0), 10g Myristic acid (C14:0), 10g Palmitic acid (C16:0), 10g Stearic acid (C18:0), 10g Arachidic acid (C20:0), 10g Behenic acid (C22:0), 10g Lignoceric acid (C24:0), 10g		EC10-1KT
Fatty Acids, Even Carbon Straight Chains Kit	<i>10 individually packaged fatty acids in the amounts indicated</i> Caproic acid (C6:0), 10mL Caprylic acid (C8:0), 10mL Capric acid (C10:0), 10g Lauric acid (C12:0), 10g Myristic acid (C14:0), 10g Palmitic acid (C16:0), 10g Stearic acid (C18:0), 5g Arachidic acid (C20:0), 5g Behenic acid (C22:0), 5g Lignoceric acid (C24:0), 1g		EC10A-1KT
Fatty Acids, Odd Carbon Straight Chains Kit	<i>9 individually packaged fatty acids, 1g each</i> Heptanoic acid (C7:0) (approx. 98% pure) Nonanoic acid (C9:0) (97-99% pure) Undecanoic acid (C11:0) Tridecanoic acid (C13:0) Pentadecanoic acid (C15:0) Heptadecanoic acid (C17:0) Nonadecanoic acid (C19:0) Heneicosanoic acid (C21:0) Tricosanoic acid (C23:0)		OC9-1KT
Volatile Acid Standard Mix	<i>10 components, 10mM each in 100mL deionized water</i> Formic acid Acetic acid Propionic acid Isobutyric acid Butyric acid Isovaleric acid n-Valeric acid Isocaproic acid (4-Methyl-n-valeric acid) Hexanoic acid (n-Caproic acid) Heptanoic acid	100mL	46975-U
UNSATURATED FATTY ACIDS			
Fatty Acid Mix	<i>4 fatty acids, approx. 10mg each</i> 6,9,12,15-Octadecatetraenoic acid (18:4) (90% pure) Arachidonic acid (20:4) 5,8,11,14,17-Eicosapentaenoic acid (20:5) 4,7,10,13,16,19-Docosahexaenoic acid (22:6)	40mg	17824-1AMP
Fatty Acids, Unsaturated Kit	<i>10 individually packaged fatty acids, 100mg each</i> Palmitoleic acid (16:1) Elaidic acid (18:1, trans) Oleic acid (18:1) Petroselinic acid (18:1) Linoleic acid (18:2) Linolenic acid, ~98% (18:3) Arachidonic acid (20:4) Erucic acid (22:1) Docosahexaenoic acid (22:6) Nervonic acid (24:1)		UN10-1KT

Mono-, Di-, and Triglycerides

These standards are approximately equal weight mixtures. They are qualitative standards, useful in determining relative retention times and establishing approximate response factors.

Each mix is prepared by weight, and the composition verified by gas and/or thin layer liquid chromatography. The weight percentage of each component is indicated. Each product contains 100mg total weight of lipid unless otherwise indicated.

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
QUALITATIVE MIXES			
Triglyceride Mix	<i>5 components, approx. 20mg each</i> Tricaprylin (8:0) Tricaprin (10:0) Trilaurin (12:0) Trimyristin (14:0) Tripalmitin (16:0)	100mg	17811-1AMP
Triglyceride Mix	<i>3 components, approx. 33 1/3 mg each</i> Triolein (18:1, cis-9) Trielaidin (18:1, trans-9) Tripetroselinin (18:1, cis-6)	100mg	17818-1AMP
Olive Oil Standard Mix [▲]	<i>5 components at the concentrations indicated</i> Trilinolein (18:2), 2% 1,2-Dilinoleoyl-3-oleoyl-rac-glycerol (18:2, 18:2, 18:1), 4% Triolein (18:1), 60% 1,2-Dioleoyl-3-palmitoyl-rac-glycerol (18:1, 18:1, 16:0), 30% 1,2-Dioleoyl-3-stearoyl-rac-glycerol (18:1, 18:1, 18:0), 4%	50mg	TRI5-1AMP
Mono-, Di-, and Triglyceride Mix	<i>4 components, approx. 10mg each</i> Monoolein (18:1) 1,2-Diolein (18:1) 1,3-Diolein (18:1) Triolein (18:1)	40mg	1787-1AMP

[▲] Component percentages are target values. Actual composition may vary from lot to lot. Lot specific analysis is available upon request from our Technical Service department.

MIXES AND SOLUTIONS	COMPONENTS	CAT. NO.
QUALITATIVE MIXES (CONTD.)		
Triglycerides Kit	<i>10 individually packaged triglycerides, 50mg each</i> Trilaurin (C12:0) 1,2-Dipalmitoyl-3-myristoyl-rac-glycerol (C16:0/C16:0/C14:0) 1,2-Dilauroyl-3-myristoyl-rac-glycerol (C12:0/C12:0/C14:0) Tripalmitin (C16:0) 1,2-Dimyristoyl-3-lauroyl-rac-glycerol (C14:0/C14:0/C12:0) 1,2-Distearoyl-3-myristoyl-rac-glycerol (C18:0/C18:0/C14:0) Trimyristin (C14:0) 1,2-Distearoyl-3-palmitoyl-rac-glycerol (C18:0/C18:0/C16:0) 1,2-Dimyristoyl-3-palmitoyl-rac-glycerol (C14:0/C14:0/C16:0) Tristearin (C18:0)	TRI10-1KT
Triglycerides Kit	<i>19 individually packaged triglycerides in quantities indicated</i> Shipped in dry ice. Triacetin (C2:0), 100mg Triolein (C18:1, cis-9), 100mg Tributyrin (C4:0), 100mg Triolein (C18:1, trans-9), 100mg Tricaproin (C6:0), 1mL Trilindolein (C18:2, cis-9,12), 100mg Tricaprylin (C8:0), 0.5mL Trilinolenin (C18:3, cis-9,12,15), approx. 98%, 100mg Tricaprin (C10:0), 100mg Triarachidin (C20:0), 100mg Trilaurin (C12:0), 100mg Tri-cis-11-eicosenoic (C20:1), 100mg Trimyristin (C14:0), 1g Tribehenin (C22:0), 100mg Tripalmitin (C16:0), 100mg Trierucin (C22:1, cis-13), 100mg Tripalmitolein (C16:1, cis-9), approx. 98%, 100mg Tripetroselinin (C18:1, cis-6), 100mg	TRI19-1KT
Triglycerides, Saturated, Even Carbon Chains Kit	<i>11 individually packaged triglycerides in quantities indicated</i> Triacetin (2:0), 100mg Trimyristin (14:0), 100mg Tributyrin (4:0), 100mg Tripalmitin (16:0), 100mg Tricaproin (6:0), 1mL Tristearin (18:0), 100mg Tricaprylin (8:0), 1mL Triarachidin (20:0), 100mg Tricaprin (10:0), 100mg Tribehenin (22:0), 100mg Trilaurin (12:0), 100mg	TRI11-1KT
Mono-, Di-, and Triglycerides Kit	<i>12 individually packaged glycerides, 100mg each</i> 1-Monolauroyl-rac-glycerol (12:0) Trimyristin (14:0) Dilaurin (12:0) 1-Monopalmitoyl-rac-glycerol (16:0) Trilaurin (12:0) Dipalmitin (16:0) 1-Monomyristoyl-rac-glycerol (14:0) Tripalmitin (16:0) Dimyristin (14:0) 1-Monostearoyl-rac-glycerol (18:0) Distearin (18:0) Tristearin (18:0)	MDT12-1KT
Phospholipid Mixture for HPLC R: 45-46-23/24/25-36/37/38 S: 45-26-36/37/39-23	<i>4 components in 2.0mL of a chloroform solution</i> L- α -Phosphatidylcholine, 1.5mg/mL L- α -Phosphatidylinositol, ammonium salt, 0.9mg/mL L- α -Phosphatidylethanolamine, 1.2mg/mL L-Lysophosphatidylcholine, 0.3mg/mL	P3817-1VL

Sterols

Sterols make up the majority of the unsaponifiable matter in vegetable and animal fats. Animal fats contain mostly cholesterol, whereas most vegetable fats contain only traces of this sterol. Plant sterols are collectively called phytosterols.

These standards are not corrected for purity. Packed in amber ampul under nitrogen.

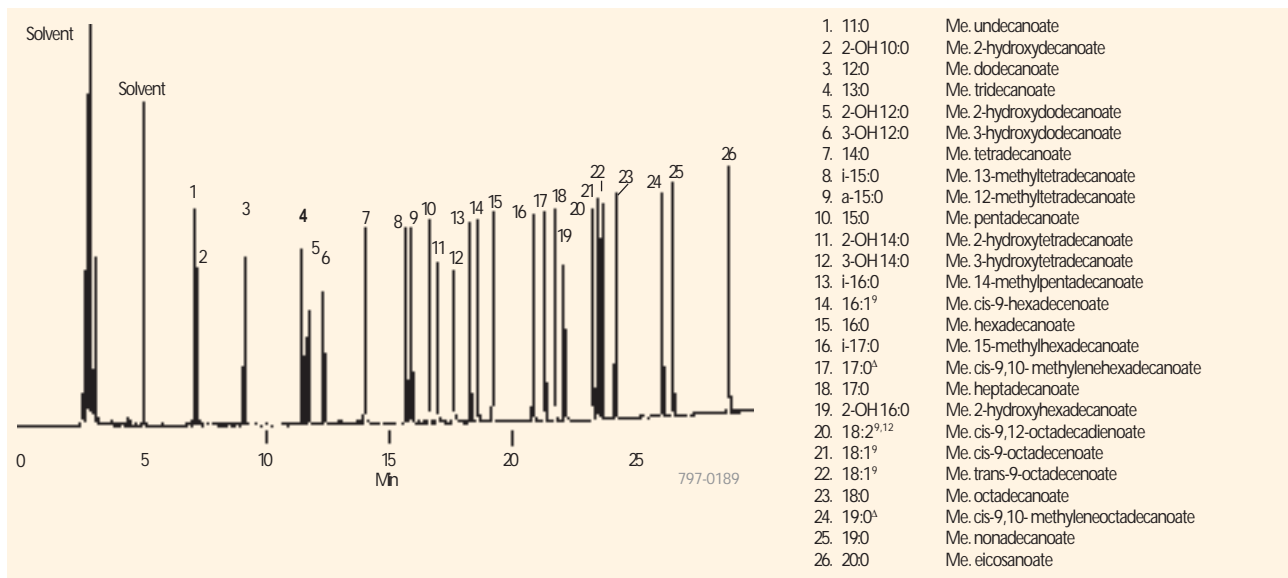
DESCRIPTION	CAS NO.	CONCENTRATION	QTY.	CAT. NO.
5- α -Cholestane	481-21-0	10mg/mL in chloroform	1mL	47124
Campesterol	474-62-4	100 μ g/mL in chloroform	1mL	47126
Cholesterol	57-88-5	10mg/mL in chloroform	1mL	47127-U
Dihydrocholesterol	80-97-7	10mg/mL in chloroform	1mL	47129
Ergosterol	57-87-4	10mg/mL in chloroform	1mL	47130-U
Stigmasterol	83-48-7	10mg/mL in chloroform	1mL	47132
β -Sitosterol	83-46-5	100 μ g/mL in chloroform	1mL	47133

*Purity approx. 60%.

Standard for Bacteria Identification

This is a qualitative standard of bacterial acid methyl esters in methyl caproate (10mg/mL total concentration).

DESCRIPTION	QTY.	CAT. NO.
Bacterial Acid Methyl Ester (BAME)	1mL	47080-U



Column: SPB-1, 30m x 0.25mm ID, 0.25µm film
 Cat. No.: 24028
 Oven: 150°C (4 min) to 250°C (5 min) at 4°C/min
 Carrier: helium, 20cm/sec (150°C)
 Det.: FID
 Inj.: 1µL

Water Soluble Fatty Acid (WSFA) Mixes

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
WSFA-2	0.1% of each fatty acid in water (weight percent) Acetic acid (C2) Butyric acid (C4) Valeric acid (C5) Propionic acid (C3) Isobutyric acid (iC4) Isovaleric acid (iC5)	5mL	47056
WSFA-4	0.1% of each fatty acid in water (weight percent) Acetic acid (C2) Isobutyric acid (iC4) 2-Methylbutyric acid (2-methyl C4) Propionic acid (C3) Valeric acid (C5) Isovaleric acid (iC5) Butyric acid (C4)	5mL	47058

Other Qualitative Standards

MIXES AND SOLUTIONS	COMPONENTS	QTY.	CAT. NO.
Volatile Acid Standard Mix	10 components, 10mM each in deionized water Formic acid n-Valeric acid Acetic acid Isocaproic acid (4-Methyl-n-valeric acid) Propionic acid Hexanoic acid (n-Caproic acid) Isobutyric acid Isovaleric acid Butyric acid Heptanoic acid	100mL	46975-U
Nonvolatile Acid Standard Mix	8 components, 1 meq of each in deionized water Pyruvic acid Methyl malonic acid Lactic acid Malonic acid Oxalacetic acid Fumaric acid Oxalic acid Succinic acid	100mL	46985-U