

**Date :** June 29, 2022

**CERTIFICATE OF ANALYSIS – TOTAL FATTY ACIDS METHYL ESTERS (FAMES)**

*SAMPLE IDENTIFICATION*

**Internal code :** 22F14-PTH01

**Customer identification :** Sunflower Organic - SQ0122R

**Type :** Vegetable oil & fats

**Source :** *Helianthus annuus*

**Customer :** Plant Therapy

*ANALYSIS*

**Method:** PC-MAT-010 - Fatty acids profiling of a vegetable oil or a plant by hydrolysis and derivatisation (FAMES).

**Analyst :** Seydou Ka, Ph. D.

**Analysis date :** June 22, 2022

Checked and approved by :

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Alexis St-Gelais, Ph. D., Chimiste 2013-174

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PHYSICOCHEMICAL DATA

**Physical aspect:** Clear viscous liquid

**Refractive index:** 1.4740 ± 0.0003 (20 °C; method PC-MAT-016)

CODEX-STAN 210-1999 - SUNFLOWERSEED OIL

Compound	Min. %	Max. %	Observed %	Complies?
Caproic acid		0.05	ND	Yes
Caprylic acid		0.05	ND	Yes
Capric acid		0.05	ND	Yes
Lauric acid		0.1	ND	Yes
Myristic acid		0.2	0.1	Yes
Palmitic acid	5.0	7.6	6.2	Yes
Margaric acid		0.2	ND	Yes
Stearic acid	2.7	6.5	4.0	Yes
Oleic acid	14.0	39.4	35.3	Yes
Linoleic acid	48.3	74.0	51.1	Yes
Arachidic acid	0.1	0.5	0.3	Yes
Behenic acid	0.3	1.5	0.9	Yes
Lignoceric acid		0.5	0.3	Yes
Nervonic acid		0.05	ND	Yes
C16:1		0.3	0.1	Yes
C17:1		0.1	ND	Yes
C18:3		0.3	ND	Yes
C20:1		0.3	0.2	Yes
C20:2		0.05	ND	Yes
C22:1		0.3	ND	Yes
C22:2		0.3	ND	Yes
<b>Refractive index</b>	1.4610	1.4680	1.4740	No

ND: Not detected.

CONCLUSION

The sample features the expected fatty acids composition for sunflower seed oil based on the applicable Codex Alimentarius standard.

ANALYSIS DATA

Fatty acids		Shorthand formula	R.T	R.I	%	Type
Common name	Systematic name					
Myristic acid	Tetradecanoic acid	C14:0	9.69	1395	0.07	SFA
Palmitic acid	Hexadecanoic acid	C16:0	12.21	1600	6.22	SFA
Hypogeic acid	(7Z)-Hexadecenoic acid	C16:1 n-9 c	13.03	1653	0.02	MUFA
Palmitoleic acid	(9Z)-Hexadecenoic acid	C16:1 n-7 c	13.19	1662	0.11	MUFA
Margaric acid	Heptadecanoic acid	C17:0	13.87	1700	0.04	SFA
<i>cis</i> -9-Heptadecenoic acid	(9Z)-Heptadecenoic acid	C17:1 n-8 c	15.03	1760	0.03	MUFA
Stearic acid	Octadecanoic acid	C18:0	16.08	1806	3.99	SFA
Octadecenoic acid isomer III	Octadecenoic acid	C18:1	17.03	1846	0.04	MUFA
Octadecenoic acid isomer V	Octadecenoic acid	C18:1	17.14	1851	0.01	MUFA
Oleic acid	(9Z)-Octadecenoic acid	C18:1 n-9 c	17.51	1865	35.26	MUFA
<i>cis</i> -Vaccenic acid	(11Z)-Octadecenoic acid	C18:1 n-7 c	17.63	1869	0.76	MUFA
Linolelaidic acid	(9E,12E)-Octadecadienoic acid	C18:2 n-6 tt	18.53	1904	0.01	PUFA
Nonadecylic acid	Nonadecanoic acid	C19:0	18.70	1910	0.01	SFA
<i>cis,trans</i> -9,12-Octadecadienoic acid	(9Z,12E)-Octadecadienoic acid	C18:2 n-6 ct	19.12	1926	0.20	PUFA
Linoleic acid	(9Z,12Z)-Octadecadienoic acid	C18:2 n-6 cc	19.79	1950	51.06	PUFA
Arachidic acid	Eicosanoic acid	C20:0	21.48	2007	0.31	SFA
$\alpha$ -Linolenic acid	(9Z,12Z,15Z)-Octadecatrienoic acid	C18:3 n-3 ccc	22.27	2034	tr	PUFA
Gondoic acid	(11Z)-Eicosenoic acid	C20:1 n-9 c	23.07	2059	0.20	MUFA
Paullinic acid	(13Z)-Eicosenoic acid	C20:1 n-7 c	23.26	2065	0.01	MUFA
<i>cis</i> -15-Eicosenoic acid?	(15Z)-Eicosenoic acid	C20:1 n-5 c	23.81	2083	tr	MUFA
Heneicosylic acid	Heneicosanoic acid	C21:0	24.49	2105	0.05	SFA
Behenic acid	Docosanoic acid	C22:0	27.75	2212	0.88	SFA
Tricosylic acid	Tricosanoic acid	C23:0	30.25	2311	0.04	SFA
Lignoceric acid	Tetracosanoic acid	C24:0	32.32	2410	0.30	SFA
Total PUFA: 51.07%						
Total MUFA: 36.55%						
Total SFA: 11.91%						
			<b>Total identified 99.64%</b>			

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied  
R.T.: Retention time (minutes)  
R.I.: Retention index  
PUFA: Polyunsaturated fatty acid  
MUFA: Monounsaturated fatty acid  
SFA: Saturated fatty acid

