

NATURAL HEALTH PRODUCT

FIXED OIL PRODUCTS – ORAL

This monograph is intended to serve as a guide to industry for the preparation of Product Licence Applications (PLAs) for natural health product market authorization. It is not intended to be a comprehensive review of the medicinal ingredients.

Notes

- This monograph only covers naturally-occurring fatty acids in each fixed oil, including concentrated oils, but excludes fixed oils spiked with additional fatty acids.
- Essential/volatile oil preparations (e.g., those prepared by distillation) are not within the scope of this monograph.
- Hydrogenated oils and partially hydrogenated oils are not within the scope of this monograph.
- This monograph may be used to support single ingredient or multi-ingredient products containing any medicinal ingredient from Table 1.
- Text in parentheses is additional optional information which can be included on the PLA and product label at the applicant's discretion.
- The solidus (/) indicates that the terms or statements are synonymous. Either term or statement may be selected by the applicant.

Date

March 28, 2024

Proper name(s), Common name(s), and Source information

Table 1. Proper name(s), Common name(s) and Source information

Proper name(s)	Common name(s)	Source information	
		Source material(s)	Part(s)
<i>Borago officinalis</i>	Borage oil	<i>Borago officinalis</i>	Seed
<i>Camelina sativa</i>	False flax oil	<i>Camelina sativa</i>	Seed
<i>Cannabis sativa</i>	Hemp seed oil	<i>Cannabis sativa</i>	Seed
Canola Oil	<ul style="list-style-type: none"> • Canola oil • Colza oil • Rapeseed oil 	<ul style="list-style-type: none"> • <i>Brassica napus</i> • <i>Brassica juncea</i> • <i>Brassica rapa</i> 	Seed
<i>Carthamus tinctorius</i>	Safflower oil	<i>Carthamus tinctorius</i>	Seed
<i>Cocos nucifera</i>	Coconut oil	<i>Cocos nucifera</i>	Seed endosperm
Cod liver oil	Cod liver oil	Gadidae ¹	Liver
<i>Cucurbita pepo</i>	Pumpkin seed oil	<i>Cucurbita pepo</i>	Seed



Proper name(s)	Common name(s)	Source information	
		Source material(s)	Part(s)
Fish oil ²	Fish oil	<ul style="list-style-type: none"> • Ammodytidae • Carangidae • Clupeidae • Engraulidae • Gadidae³ • Osmeridae • Salmonidae • Scombridae 	Whole
<i>Helianthus annuus</i>	Sunflower oil	<i>Helianthus annuus</i>	Seed
<i>Hippophae rhamnoides</i>	Sea buckthorn fruit oil	<i>Hippophae rhamnoides</i>	Fruit
	Sea buckthorn seed oil	<i>Hippophae rhamnoides</i>	Seed
Krill oil	Krill oil	<ul style="list-style-type: none"> • <i>Euphasia pacifica</i> • <i>Euphausia superba</i> 	Whole
<i>Linum usitatissimum</i>	<ul style="list-style-type: none"> • Flax oil • Flaxseed oil • Linseed oil 	<i>Linum usitatissimum</i>	Seed
<i>Oenothera biennis</i>	<ul style="list-style-type: none"> • Evening primrose oil • Primrose oil 	<i>Oenothera biennis</i>	Seed
<i>Olea europaea</i>	Olive oil	<i>Olea europaea</i>	Fruit
<i>Prunus dulcis</i>	<ul style="list-style-type: none"> • Almond oil • Sweet almond oil 	<i>Prunus dulcis</i>	Seed
<i>Ribes nigrum</i>	Blackcurrant seed oil	<i>Ribes nigrum</i>	Seed
<i>Salvia hispanica</i>	Chia seed oil	<i>Salvia hispanica</i>	Seed
<i>Schizochytrium</i> spp.	Schizochytrium oil	<i>Schizochytrium</i> spp.	Whole
Seal oil	Seal oil	<ul style="list-style-type: none"> • <i>Cystophora cristata</i> • <i>Erignathus barbatus</i> • <i>Halichoerus grypus</i> • <i>Pagophilus groenlandicus</i> • <i>Phoca vitulina</i> • <i>Pusa hispida</i> 	Blubber
Squid oil	Squid oil	<ul style="list-style-type: none"> • <i>Todarodes pacificus</i> • <i>Docidicus gigas</i> • <i>Illex argentinus</i> • <i>Illex illecebrosus</i> 	Whole
<i>Triticum aestivum</i>	Wheat germ oil	<i>Triticum aestivum</i>	Seed germ
<i>Vitis vinifera</i>	Grape seed oil	<i>Vitis vinifera</i>	Seed

References: Proper names: NHPID 2023; Common names: NHPID 2023; Source information: FCC 2023, ITIS 2023, USP-NF 2023, Ph.Eur 2023, Linnamaa et al. 2010, Yurko-Mauro et al. 2010, Dubois et al. 2007, Callaway et al. 2005, Hoffmann 2003, Yang et al. 1999.

¹ **Cod liver oil:** The species common names and not the family could be listed on the label.

² **Fish oil:** Corresponds to oil from the whole body of one or more of species of the families listed in Table 1 in its natural and/or concentrated triglyceride/triacylglycerol form and/or its concentrated esterified form (BP 2023; Ph.Eur. 2023; Froese and Pauly 2022). The species common names and not the family could be listed on the label.

³ **Fish oil:** For fish oils including species of Gadidae as a source material, the vitamin A and D content should be tested to ensure that the daily maximum amounts meet the Multi-Vitamin/Mineral Supplements monograph for each age group.

Route of administration

Oral

Dosage form(s)

This monograph excludes foods or food-like dosage forms as indicated in the Compendium of Monographs Guidance Document.

Acceptable dosage forms for oral use are indicated in the dosage form drop-down list of the web-based Product Licence Application form for Compendial applications.

Use(s) or Purpose(s) and Dose(s)

Subpopulation

Adults 18 years and older

Quantity(ies)

Refer to Table 2 and 3.

Table 2. Uses or purposes, associated daily dose and potency constituents (LA – Linoleic acid; ALA – Alpha-linolenic acid; EPA - Eicosapentaenoic acid; DHA - Docosahexaenoic acid; DPA - Docosapentaenoic acid; GLA-Gamma-linolenic acid; OA – Oleic acid)

Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
Borage oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of essential fatty acids for the maintenance of good health • Source of omega-6 fatty acids for the maintenance of good health • Source of linoleic acid (LA) for the maintenance of good health 	Oil: 3.7-5 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 5 g and LA, ALA, GLA and/or OA as per Table 3*	LA, ALA, GLA, OA
Hemp seed oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA, GLA and/or OA as per Table 3*	LA, ALA, GLA, OA
Canola oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
False flax oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Safflower oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A



Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Coconut oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals 	Oil: up to 15 g	N/A
	Standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals and/or • As per Table 3 	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Cod liver oil	Standardized fixed oil	As per Cod liver oil monograph	Oil: up to 4 g and Amounts of EPA, DHA, Vitamin A and Vitamin D as per the Cod liver oil	EPA, DHA, Vitamin A, Vitamin D



Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
			monograph	
		As per Table 3	Oil: up to 4 g and Minimum amounts of EPA and/or DHA as per Table 3* and Maximum amounts of EPA, DHA, Vitamin A and Vitamin D as per the Cod liver oil monograph	EPA, DHA, Vitamin A, Vitamin D
Pumpkin seed oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA and/or OA as per Table 3*	LA, OA
Fish oil	Standardized fixed oil	As per Fish oil monograph	As per the fish oil monograph	EPA, DHA
		As per Table 3	Oil: up to 10 g and EPA and/or DHA as per Table 3*	EPA, DHA
Sunflower oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals 	Oil: up to 15 g	N/A
	Standardized	<ul style="list-style-type: none"> • Source of 	Oil: up to 15 g	LA, OA

Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
	fixed oil	antioxidant(s)/Provides antioxidant(s) <ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals and/or <ul style="list-style-type: none"> • As per Table 3 	and LA and/or OA as per Table 3*	
Sea buckthorn seed oil	Non-standardized fixed oil	N/A	Oil: up to 5 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 5 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Sea buckthorn fruit oil	Non-standardized fixed oil	N/A	Oil: up to 5 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 5 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Krill oil	Standardized fixed oil	<ul style="list-style-type: none"> • Source of EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) for the maintenance of good health • Source of omega-3 fatty acids for the maintenance of good health • Source of the omega-3 fatty acids such as EPA 	Oil: up to 4.1 g and EPA+DHA: 100 mg or more	EPA, DHA



Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
		and DHA		
		As per Table 3	Oil: up to 4.1 g and EPA and/or DHA as per Table 3*	EPA, DHA
Flaxseed oil	Non-Standardized fixed oil	<ul style="list-style-type: none"> • Source of essential fatty acid (alpha-linolenic acid (ALA)) for the maintenance of good health • Source of omega-3 fatty acids for the maintenance of good health • Source of alpha-linolenic acid (ALA) for the maintenance of good health 	Oil: 0.23-32 g	N/A
		<ul style="list-style-type: none"> • Source of essential fatty acid (linoleic acid (LA)) for the maintenance of good health • Source of essential fatty acids (alpha-linolenic acid (ALA) and linoleic acid (LA)) for the maintenance of good health • Source of omega-6 fatty acids for the maintenance of good health • Source of linoleic acid (LA) for the maintenance of good health 	Oil: 7.7-32 g	
	Standardized fixed oil	As per Table 3	Oil: up to 32 g and LA, ALA and/or OA as per Table 3*	



Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
Evening primrose oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of essential fatty acids for the maintenance of good health • Source of omega-6 fatty acids for the maintenance of good health • Source of linoleic acid (LA) for the maintenance of good health 	Oil: 1.3-6 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 6 g and LA, ALA, GLA and/or OA as per Table 3*	LA, ALA, GLA, OA
Olive oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals 	Oil: up to 15 g	N/A
	Standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative 	Oil: up to 15 g and LA and/or OA as per Table 3*	LA, OA



Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
		effect of/the oxidative damage caused by/cell damage caused by) free radicals and/or <ul style="list-style-type: none"> As per Table 3 		
Almond oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Blackcurrant seed oil	Non-standardized fixed oil	N/A	Oil: up to 10.5 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 10.5 g and LA, ALA, GLA and/or OA as per Table 3*	LA, ALA, GLA, OA
Chia seed oil	Non-standardized fixed oil	N/A	Oil: up to 4.5 g	N/A
	Standardized fixed oil	As per Table 3	Oil: up to 4.5 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Schizochytrium oil	Standardized fixed oil	Helps support cognitive health and/or brain function	DHA: 200-2,000 mg	EPA, DHA
		As per Table 3	Oil: up to 5 g and EPA and/or DHA as per Table 3*	
Seal oil	Standardized fixed oil	As per Seal oil monograph	As per Seal oil monograph	EPA, DHA, DPA
		As per Table 3	Oil: up to 10 g and EPA, DHA and/or DPA as per Table 3*	
Squid oil	Non-standardized	N/A	Oil: up to 5 g	N/A

Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
	fixed oil			
	Standardized fixed oil	As per Table 3	Oil: up to 5 g and EPA and/or DHA as per Table 3*	EPA, DHA
Wheat germ oil	Non-standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals 	Oil: up to 15 g	N/A
	Standardized fixed oil	<ul style="list-style-type: none"> • Source of antioxidant(s)/Provides antioxidant(s) • Source of antioxidant(s)/Provides antioxidant(s) that help(s) fight/protect (cell) against/reduce (the oxidative effect of/the oxidative damage caused by/cell damage caused by) free radicals and/or <ul style="list-style-type: none"> • As per Table 3 	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA
Grape seed oil	Non-standardized fixed oil	N/A	Oil: up to 15 g	N/A

Medicinal ingredients	Methods of preparation	Uses or Purposes	Daily Dose ¹	Potency constituents
	Standardized fixed oil	As per Table 3	Oil: up to 15 g and LA, ALA and/or OA as per Table 3*	LA, ALA, OA

References: NNHPD 2023; Zielinska et al. 2017; Quinn et al. 2010; Yang et al. 1999; Leventhal et al. 1994.

¹The amount of fixed oils can also be represented in volumetric amount (i.e. ml) based on the density information listed in Appendix 1.

*The total amount of a specific fatty acid (e.g. LA) in the product should meet the minimum dose as per Table 3 to support a claim from this table. It is not required that each oil meets the minimum amount of specific fatty acids if the total amount of a fatty acid in the finished product meets it.

Table 3. Uses or Purposes based on potency constituents - fatty acids

Potency constituents: Fatty acids ¹	Uses or Purposes	Minimum Daily Doses ²
LA	<ul style="list-style-type: none"> Source of linoleic acid (LA) for the maintenance of good health Source of omega-6 fatty acid for the maintenance of good health Source of an essential fatty acid for the maintenance of good health 	850 mg
ALA	<ul style="list-style-type: none"> Source of alpha-linolenic acid (ALA) for the maintenance of good health Source of omega-3 fatty acid for the maintenance of good health Source of an essential fatty acid for the maintenance of good health 	80 mg
LA + ALA	Source of essential fatty acids for the maintenance of good health	850 mg LA and 80 mg ALA
EPA + DHA or EPA + DPA or DHA + DPA or EPA + DHA + DPA	Source of omega-3 fatty acids for the maintenance of good health	100 mg
EPA	Source of eicosapentaenoic acid (EPA) for the maintenance of good health	100 mg
DHA	Source of docosahexaenoic acid (DHA) for the maintenance of good health	100 mg

Potency constituents: Fatty acids ¹	Uses or Purposes	Minimum Daily Doses ²
	<ul style="list-style-type: none"> Helps support/maintain cognitive health Helps support/maintain brain function 	150 mg
	<ul style="list-style-type: none"> Helps support/maintain eye health/function Helps support/maintain visual health/function 	200 mg
DPA	Source of docosapentaenoic acid (DPA) for the maintenance of good health	100 mg
EPA + DHA	<ul style="list-style-type: none"> Helps support/maintain (normal) heart/cardiovascular health Helps support/maintain (normal) heart/cardiovascular function 	200 mg
	<ul style="list-style-type: none"> Helps support/maintain normal (blood) triglyceride/triacylglycerol levels Helps reduce (blood) triglyceride(s)/triacylglycerol(s) (levels) 	1000 mg
GLA	<ul style="list-style-type: none"> Source of gamma-linoleic acid (GLA) for the maintenance of good health Source of omega-6 fatty acid for the maintenance of good health 	100 mg
OA	Source of oleic acid (OA)	100 mg

¹For products making claims from this table, the potencies must be indicated for the relevant fatty acid constituents.

²References: NNHPD 2023, EFSA 2010a, EFSA 2010b, EFSA 2009, Simopolous 2007, IOM 2006, IOM 2002, Simopolous 1999.

Notes:

- The above uses can be combined on the product label (e.g. Helps reduce triglycerides and maintain cardiovascular health).
- The terms 'Helps' or 'Helps to' can be used interchangeably on the label.

Direction(s) for use

No statement required.

Combination rules and restrictions

- A use or purpose statement is only acceptable if at least one medicinal ingredient/potency constituent associated with that statement is present at a dose at or above the minimum daily dose listed in Tables 2 and 3.
- Medicinal ingredients which do not meet the minimum daily dose for a use or purpose statement will be considered as acceptable complementary medicinal ingredients in product formulations.

- All medicinal ingredients included in this monograph may be combined with the following restrictions:
 - The combined maximum daily dose of oils in a product must not exceed 15.0 g per day (NNHPD 2023). Maximum daily doses for individual medicinal ingredient as per Table 2 apply.
 - The combined maximum daily dose of EPA+DHA or EPA+DHA+DPA in a single product must not exceed 5,000 mg for 18 years and older per day (US FDA 2019; EFSA 2012).

Duration(s) of Use

No statement required.

Risk Information

Caution(s) and warnings(s)

Products containing Hemp seed oil, Sea buckthorn seed oil, Krill oil, Blackcurrant seed oil and/or Squid oil

Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are pregnant or breastfeeding.

Products containing fish oil

Pain of rheumatoid arthritis

Ask a health care practitioner/health care provider/health care professional/doctor/physician if symptoms worsen.

Healthy mood balance

Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have psychological disorders such as anxiety or depression.

Contraindication(s)

No statements required.

Known adverse reaction(s)

Products containing Krill oil and/or Squid oil

Stop use if hypersensitivity/allergy occurs (HC 2017).

Non-medicinal ingredients

Must be chosen from the current Natural Health Products Ingredient Database (NHPID) and must meet the limitations outlined in that database.

Storage conditions

Must be established in accordance with the requirements described in the *Natural Health Products Regulations*.

Products containing Schizochytrium oil, False flax oil, Hemp seed oil, Cod liver oil, Fish oil, Sea buckthorn seed oil, Krill oil, Flaxseed oil, Black current seed oil, Chia seed oil, Seal oil and Squid Oil except those encapsulated

Refrigerate after opening (Wille and Gonus 1989).

All products (information for industry; not for labelling)

To be packaged in airtight container, protected from light (Ph.Eur. 2023; USP-NF 2023).

Specifications

- The finished product specifications must be established in accordance with the requirements described in the Natural and Non-prescription Health Products Directorate (NNHPD) Quality of Natural Health Products Guide.
- The medicinal ingredients must comply with the requirements outlined in the NHPID.
- Cod liver oil, Fish oil, Krill oil, Seal oil and Squid oil are considered marine oils and therefore the requirements for the contaminants in marine oils of the NNHPD Quality of Natural Health Products Guide applies to products containing these ingredients apply.
- The requirements for the oxidative stability in oils of the NNHPD Quality of Natural Health Products Guide applies to all products containing any medicinal ingredient on this monograph.
- For all products indicating one or more of the potencies listed in the dose section, an assay must be performed in order to confirm the potency(ies).

Fish oil from Gadidae species

For fish oils including Gadidae as a source material, the vitamin A and D content should be tested to ensure that their respective daily maximum amounts meet the Multi-Vitamin/Mineral Supplements monograph for each age group.

Hemp seed oil

Products containing Hemp seed oil must not contain more than 10 parts per million delta-9-

Tetrahydrocannabinol (THC), or phytocannabinoids that have been isolated or concentrated. The determination of the THC concentration must take into account the potential to convert delta-9-tetrahydrocannabinolic acid (THCA) to THC. Hemp derivatives (e.g. hemp seed oil) must also be compliant with the Industrial Hemp Regulations (IHR). All sources of hemp falling under the IHR are expected to be of an approved cultivar, defined in the IHR as any variety of industrial hemp set out in the List of Approved Cultivars, published by the Government of Canada on its website, as amended from time to time.

EXAMPLE OF PRODUCT FACTS:

Consult the Guidance Document, [Labelling of Natural Health Products](#) for more details.

Product Facts	
Medicinal ingredients in each capsule	
Fish oil (Atlantic salmon, sardine, tuna – whole)	XX mg
Providing YY mg of Eicosapentaenoic acid (EPA); ZZ mg of Docosahexaenoic acid (DHA)	
Evening primrose oil (<i>Oenothera biennis</i> – seed)	XX mg
Olive oil (<i>Olea europaea</i> – fruit)	XX mg
Wheat germ oil (<i>Triticum aestivum</i> – seed germ)	XX mg
Providing: Linoleic acid YY mg	
Uses	
<ul style="list-style-type: none"> • In conjunction with conventional therapy, helps to reduce the pain of rheumatoid arthritis in adults. • Helps to promote healthy mood balance. • Source of essential fatty acids for the maintenance of good health. • Source of omega-6 fatty acids for the maintenance of good health. • Source of linoleic acid (LA) for the maintenance of good health. • Source of antioxidants • Source of antioxidants that help protect cell against free radicals. 	
Warnings	
If applicable¹:	
Allergens: food allergen, gluten (gluten source), sulphites	
Contains aspartame	
Ask a health care practitioner before use if you have psychological disorders such as anxiety or depression².	
Ask a health care practitioner if symptoms worsen³.	
Directions	
Adults 18 years and older: Take X capsule(s), X time(s) a day.	
Other information	
(Add storage information)	
Non-medicinal ingredients	
List all NMIs	
Questions? (Call) 1-XXX-XXX-XXXX	

¹ This section can be removed from the table if the product contains no allergen or aspartame.

² The qualifier ‘If used for healthy mood balance:’ may be added to the label to inform consumers.

³ The qualifier ‘For pain of rheumatoid arthritis:’ may be added to the label to inform consumers.

References cited

Alamu OJ, Dehinbo O, Sulaiman AM. Production and testing of coconut oil biodiesel fuel and its blend. *Leonardo Journal of Sciences*. 2010;16:95-104.

BP 2023: *British Pharmacopoeia 2023*. London (GB): The Stationary Office on behalf of the Medicines and Healthcare products Regulatory Agency (MHRA);2023.

Budavari, S., Ed. Evening primrose oil (monograph number 3953) and Linoleic acid (monograph number 5529). *The Merck Index*, 12th ed. Merck and Company, Inc., Whitehouse Station, NJ. CD-ROM version 12:1, Chapman & Hall Electronic Publishing Division 1996.

Callaway J, Schwab U, Harvima I, Halonen P, Mykkanen O, Hyvonen P, Jarinen T. Efficacy of dietary hempseed oil in patients with atopic dermatitis. *Journal of Dermatological Treatment* 2005;16:87-94.

Delgado-Tobón A.E, Aperador-Charparro W.A, García-Cáceres R. Evaluation of the lubricating power of sweet almond oil without additives. *Revista DYNA* 2018;85(205):179-183.

Dubois V, Breton S, Linder M, Fanni J, Parmentier M. Fatty acid profiles of 80 vegetable oils with regard to their nutritional potential. *European Journal of Lipid Science and Technology* 2007;109:710-732.

Edwin E, Garcia R, Jane SR, Coimbra, Javier T. Thermophysical Properties of Cotton, Canola, Sunflower and Soybean Oils as a Function of Temperature. *International Journal of Food Properties* 2013;16(7):1620-1629.

EFSA 2009. European Food Safety Authority. Scientific Opinion: Scientific opinion on the substantiation of health claims related to EPA, DHA, DPA and maintenance of normal blood pressure (ID 502), maintenance of normal HDL-cholesterol concentrations (ID 515), maintenance of normal (fasting) blood concentrations of triglycerides (ID 517), maintenance of normal LDL-cholesterol concentrations (ID 528, 698) and maintenance of joints (ID 503, 505, 507, 511, 518, 524, 526, 535, 537) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Panel of Dietetic Products, Nutrition and Allergies (NDA). *EFSA Journal* 2009;7(9): 1263. [Accessed 2023 March 07]. Available from: <http://www.efsa.europa.eu/en/efsajournal/doc/1263.pdf>

EFSA 2010a. Scientific Opinion on the substantiation of health claims related to docosahexaenoic acid (DHA) and maintenance of normal (fasting) blood concentrations of triglycerides (ID 533, 691, 3150), protection of blood lipids from oxidative damage (ID 630), contribution to the maintenance or achievement of a normal body weight (ID 629), brain, eye and nerve development (ID 627, 689, 704, 742, 3148, 3151), maintenance of normal brain function (ID 565, 626, 631, 689, 690, 704, 742, 3148, 3151), maintenance of normal vision (ID 627, 632, 743, 3149) and maintenance of normal spermatozoa motility (ID 628) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). *EFSA Journal* 2010; 8(10):1734. [Accessed 2023 March 07]. Available

from: <http://www.efsa.europa.eu/en/efsajournal/doc/1734.pdf>.

EFSA 2010b. Scientific Opinion on the substantiation of health claims related to eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), docosapentaenoic acid (DPA) and maintenance of normal cardiac function (ID 504, 506, 516, 527, 538, 703, 1128, 1317, 1324, 1325), maintenance of normal blood glucose concentrations (ID 566), maintenance of normal blood pressure (ID 506, 516, 703, 1317, 1324), maintenance of normal blood HDL-cholesterol concentrations (ID 506), maintenance of normal (fasting) blood concentrations of triglycerides (ID 506, 527, 538, 1317, 1324, 1325), maintenance of normal blood LDL-cholesterol concentrations (ID 527, 538, 1317, 1325, 4689), protection of the skin from photo-oxidative (UV-induced) damage (ID 530), improved absorption of EPA and DHA (ID 522, 523), contribution to the normal function of the immune system by decreasing the levels of eicosanoids, arachidonic acid-derived mediators and pro-inflammatory cytokines (ID 520, 2914), and “immunomodulating agent” (4690) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). EFSA Journal 2010; 8(10):1796. [Accessed 2023 March 07]. Available from: <http://www.efsa.europa.eu/en/efsajournal/doc/1796.pdf>.

EFSA 2012: European Food Safety Authority. Scientific Opinion: Scientific opinion on the tolerable upper intake level of eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA) and docosapentaenoic acid (DPA). EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). EFSA Journal 2012;10(7):2815. [Accessed 2023 March 07]. Available from: <http://www.efsa.europa.eu/en/efsajournal/doc/2815.pdf>.

Firestone, D, editor. Physical and chemical characteristics of oils, fats, and waxes, 3rd edition. Urbana (IL): American Oil Chemists' Society 2013.

Fitzpatrick KC. Invitational Consultation on Fatty Acids. Winnipeg (MB): Nutritech Consulting; 2005.

Food Chemicals Codex. Eighth edition. Rockville (MD): The United States Pharmacopeial Convention; 2023.

HC 2017: Health Canada. Crustaceans and Molluscs. Priority food allergens. [Accessed 2023 March 07]. Available from: <https://www.canada.ca/content/dam/hc-sc/documents/services/food-nutrition/reports-publications/food-safety/2017-crustaceans-crustaces-eng.pdf>

Hoffmann D. Medical Herbalism: The Science and Practice of Herbal Medicine. Rochester (VT): Healing Arts Press; 2003.

IOM 2006: Institute of Medicine. Otten JJ, Pizzi Hellwig J, Meyers LD, editors. Institute of Medicine Dietary Reference Intakes: The Essential Guide to Nutrient Requirements. Washington (DC): National Academies Press; 2006.

IOM 2002: Panel on Macronutrients, Panel on the Definition of Dietary Fiber, Subcommittee

on Upper Reference Levels of Nutrients, Subcommittee on Interpretation and Uses of Dietary Reference Intakes, and the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes. Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.

ITIS 2023: Integrated Taxonomic Information System. Taxon Based on Biological Information System. Canadian Biodiversity Information Facility, Government of Canada. [Accessed 2023 March 07]. Available from: <http://www.cbif.gc.ca/acp/eng/itis/search>

Karvonen HM, Aro A, Tapola NS, Salminen I, Uusitupa MIJ, Sarkkinen ES. Effect of α -linolenic acid-rich *Camelina sativa* oil on serum fatty acid composition and serum lipids in hypercholesterolemic subjects. *Metabolism* 2002;51(10): 1253-1260.

Kyte R.M. Technological studies on the processing of sea lions. *Commercial fisheries review* 1956;18 (6).

Lee H-Y, Haque A.S.M. T, Kim S-B, Lee T-B, Chun B-S. Effect of reaction parameters on conversion of krill (*Euphausia superba*) oil by immobilized lipase ethanolysis. *Journal of Industrial and Engineering Chemistry* 2014;20(3):1097-1102.

Leventhal LJ, Boyce EG, Zurier RB. Treatment of rheumatoid arthritis with blackcurrant seed oil. *British Journal of Rheumatology* 1994;33:847-852.

Linnamaa P, Savolainen J, Koulu L, Tuomasjukka S, Kallio H, Yang B, Vahlberg T, Tahvonen R. Blackcurrant seed oil for prevention of atopic dermatitis in newborns: a randomized, double-blind, placebo-controlled trial. *Clinical and Experimental Allergy: Journal of the British Society for Allergy and Clinical Immunology* 2010;40:1247-1255.

Manisha K, Sharma P.C. Nutritional and antimicrobial property of seabuckthorn (*Hippophae* sp.) seed oil. *Journal of Scientific and Industrial Research* 2011;70:1033-1036.

Moovendhan M, Kavisri M, Vairamani S, Shanmugam A. Valorization of cephalopod liver viscera for oil production: chemical characteristics, nutritional profile and pharmacological activities. *Biomass Conversion and Biorefinery* 2021.

NNHPD 2023: Non-prescription and Natural Health Products Directorate. Internal evidence on Natural Health Products.

Petcu AC, Pleșu V, Berbente Corneliu. Estimation methods for thermophysical properties of camelina sativa crude oil. *University Polithenica of Bucharest Scientific Bulletin* 2016;78(1):59-70.

Ph.Eur. 2023: European Pharmacopoeia. 11th edition. Strasbourg (FR): Directorate for the Quality of Medicines and HealthCare of the Council of Europe (EDQM); 2023.

Purnamayati L, Sumardianto, Romadhon, Dewi EN. Physical Blending Characteristics of Fish Oil and Sesame Oil. IOP Conference Series: Earth and Environmental Science 2019;246:012054.

Quinn JF, Raman R, Thomas RG, Yurko-Mauro K, Nelson EB, Van Dyck C, Galvin JE, Emond J, Jack CR, Weiner M, Shinto L, Aisen PS. Docosahexaenoic acid supplementation and cognitive decline in Alzheimer's disease. *Journal of the American Medical Association* 2010;304(17): 1903-1911.

Simopoulos AP. Omega-3 fatty acids and athletics. *Current Sports Medicine Reports* 2007; 6(4):230-236.

Simopoulos AP. Essential fatty acids in health and chronic disease. *The American Journal of Clinical Nutrition* 1999;70(3):560S-569S.

Subrahmanyam MSR, Vedanayagam S, Venkatacharyulu P. Estimation of the sharma constant and thermoacoustic properties of vegetables oils. *Journal of the American Oil Chemists' Society*. 1994;71(8): 901-905

Turck D, Castenmiller J, De Henauw S, Hirsch-Ernst K.I, Kearney J, Knutsen H.K, Maciuk A, Mangelsdorf I., McArdle H.J, Naska A, Pelaez C, Pentieva K., Siani A., Thies F., Tsabouri S. and Vinceti M. Safety of oil from *Schizochytrium limacinum* (strain FCC-3204) for use in food supplements as a novel food pursuant to Regulation (EU) 2015/2283. *European Food Safety Authority Journal*. 2021;19 (1): 6345.

US FDA 2019. FDA Announces new qualified health claims for EPA and DHA Omega-3 consumption and the risk of hypertension and coronary disease; and associated link: FDA Response to Petition for Qualified Health Claim that EPA and DHA Omega-3 Consumption May Reduce Risk of Hypertension. [Accessed 2024 February 22]. Available from: <https://www.fda.gov/food/cfsan-constituent-updates/fda-announces-new-qualified-health-claims-epa-and-dha-omega-3-consumption-and-risk-hypertension-and>

USP-NF 2023: United States Pharmacopeia and the National Formulary. Rockville (MD): The United States Pharmacopeial Convention; <https://online.uspnf.com>.

Uzunova M., Perifanova-Nemska M., Petkova Zh., Minkova St., Nikolova Kr. Physiochemical characteristics of chia seed oil from Peru. *Bulgarian Chemical Communications* 2019;51:217-220.

Wille HJ, Gonus P. Preparation of fish oil for dietary applications. In: Galli C, Simopolous AP, editors. *Dietary ω -3 and ω -6 Fatty Acids. Biological Effects and Nutritional Essentiality*. New York (NY): Plenum Press; 1989.

Yang B, Kalimo KO, Matilla LM, Kallio SE, Katajisto JK, Peltola OJ, Kallio HP. Effects of dietary supplementation with sea buckthorn (*Hippophae rhamnoides*) seed and pulp oils in atopic dermatitis. *Journal of Nutritional Biochemistry* 1999;10:622-630

Yurko-Mauro K, McCarthy D, Rom D, Nelson EB, Ryan AS, Blackwell A, Salem N, Stedman M. Beneficial effects of docosahexaenoic acid on cognition in age-related cognitive decline, *Alzheimer's and Dementia* 2010;6:1-9.

Zhang Z-S, Wang L-J, Li D, Li S-J, Özkan N. Characteristics of flaxseed oil from two different flax plants. *International Journal of Food Properties* 2011;14:1286-1296.

Zielinska A, Nowak I. Abundance of active ingredients in sea-buckthorn oil. *Lipids in Health and Disease* 2017;16(1):95.

References reviewed

Ackman RG. The absorption of fish oils and concentrates. *Lipids* 1992;27(11):858-862.

Aggett PJ, Antoine JM, Asp NG, Bellisle F, Contor L, Cummings JH, Howlett J, Müller DJ, Persin C, Pijls LT, Rechkemmer G, Tuijtelars S, Verhagen H. PASSCLAIM: consensus on criteria. *European Journal of Nutrition* 2005;44(Suppl 1):i5-i30.

Agostini C, Massetto N, Biasucci G, Rottoli A, Bonvissuto M, Bruzzese MG, Giovannini M, Riva E. Effects of long-chain polyunsaturated fatty acid supplementation on fatty acid status and visual function in treated children with hyperphenylalaninemia. *Journal of Pediatrics* 2000; 137(4):504-509.

Ahmed AA, Holub BJ. Alteration and recovery of bleeding times, platelet aggregation and fatty acid composition of individual phospholipids in platelets of human subjects receiving a supplement of cod liver oil. *Lipids* 1984;19(8):617-624.

Angerer P, Kothny W, Störk S, von Schacky C. Effect of dietary supplementation with omega-3 fatty acids on progression of atherosclerosis in carotid arteries. *Cardiovascular Research* 2002; 54(1):183-190.

Annuzzi G, Rivellese A, Capaldo B, Di Marino L, Iovine C, Marotta G, Riccardi G. A controlled study on the effects of n-3 fatty acids on lipid and glucose metabolism in non-insulin-dependent diabetic patients. *Atherosclerosis* 1991;87(1):65-73.

Appel LJ, Miller ER, Seidler AJ, Whelton PK. Does supplementation of diet with 'fish oil' reduce blood pressure? *Archives of Internal Medicine* 1993;153(12):1429-1438.

Bairati I, Roy L, Meyer F. Effects of a fish oil supplement on blood pressure and serum lipids in patients treated for coronary artery disease. *Canadian Journal of Cardiology* 1992;8(1):41-46.

Barnes J, Anderson LA, Philipson JD. *Herbal Medicines*, 3rd edition. London (GB): The Pharmaceutical Press; 2007.

Beblo S, Reinhardt H, Muntau AC, Mueller-Felber W, Roscher AA, Koletzko B. Fish oil supplementation improves visual evoked potentials in children with phenylketonuria. *Neurology* 2001;57(8):1488-1491.

Beblo S, Reinhardt H, Demmelmair H, Muntau AC, Koletzko B. Effects of fish oil supplementation on fatty acid status, coordination, and fine motor skills in children with phenylketonuria. *Journal of Pediatrics* 2007;150(5):479-484.

Bender NK, Kraynak MA, Chiquette E, Linn WD, Clark GM, Bussey HI. Effects of marine fish oils on the anticoagulation status of patients receiving chronic warfarin therapy. *Journal of Thrombosis and Thrombolysis* 1998;5(3):257-261.

Berardi RR, DeSimone EM, Newton GD, Oszko MA, Popovich NG, Rollins CJ, Shimp LA, Tietze KJ, editors. *Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care*, 13th edition. Washington (DC): American Pharmaceutical Association; 2002.

Berbert AA, Kondo CR, Almendra CL, Matsuo T, Dichi I. Supplementation of fish oil and olive oil in patients with rheumatoid arthritis. *Nutrition* 2005;21(2):131-136.

Birberg-Thornberg U, Karlsson T, Gustafsson PA, Duchon K. Nutrition and theory of mind—the role of polyunsaturated fatty acids (PUFA) in the development of theory of mind. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2006;75(1):33-41.

Birch DG, Birch EE, Hoffman DR, Uauy RD. Retinal development in very-low-birth-weight infants fed diets differing in omega-3 fatty acids. *Investigative Ophthalmology and Visual Science* 1992;33(8):2365-2376.

Birch EE, Castaneda YS, Wheaton DH, Birch DG, Uauy RD, Hoffman DR. Visual maturation of term infants fed long-chain polyunsaturated fatty-acid supplemented or control formula for 12 mo. *The American Journal of Clinical Nutrition* 2005;81(4):871-879.

Birch EE, Hoffman DR, Castañeda YS, Fawcett SL, Birch DG, Uauy RD. A randomized controlled trial of long-chain polyunsaturated fatty acid supplementation of formula in term infants after weaning at 6 wk of age. *The American Journal of Clinical Nutrition* 2002; 75(3):570-580.

Birch EE, Garfield S, Hoffman DR, Uauy R, Birch DG. A randomized controlled trial of early long-chain polyunsaturated fatty acids and mental development in term infants. *Developmental Medicine and Child Neurology* 2000;42(3):174-181.

Blonk MC, Bilo HJ, Nauta JJ, Popp-Snijders C, Mulder C, Donker AJ. Dose-response effects of fish-oil supplementation in healthy volunteers. *The American Journal of Clinical Nutrition* 1990; 52(1):120-127.

Bønaa KH, Bjerve KS, Nordøy A. Docosahexaenoic and eicosapentaenoic acids in plasma phospholipids are divergently associated with high density lipoprotein in humans. *Arteriosclerosis and Thrombosis* 1992;12(6):675-681.



Bonefeld-Jørgensen EC, Møller SM, Hansen JC. Modulation of atherosclerotic risk factors by seal oil: a preliminary assessment. *International Journal of Circumpolar Health* 2001;60(1):25-33.

Bonnema SJ, Jespersen LT, Marving J, Gregersen G. Supplementation with olive oil rather than fish oil increases small arterial compliance in diabetic patients. *Diabetes Nutrition and Metabolism* 1995;8(2):81-87.

Boon H. Flax. In: Chandler F, editor. *Herbs: Everyday Reference for Health Professionals*. Ottawa (ON): Canadian Pharmacists Association and the Canadian Medical Association; 2000.

Bourre JM. Effects of nutrients (in food) on the structure and function of the nervous system: update on dietary requirements for brain. Part 2: macronutrients. *Journal of Nutrition, Health, and Aging* 2006;10(5):386-399.

Brady LM, Lovegrove SS, Lesauvage SV, Gower BA, Minihane AM, Williams CM, Lovegrove JA. Increased n-6 polyunsaturated fatty acids do not attenuate the effects of long-chain n-3 polyunsaturated fatty acids on insulin sensitivity or triacylglycerol reduction in Indian Asians. *The American Journal of Clinical Nutrition* 2004;79(6):983-991.

Brinker F. *Herb Contraindication and Drug Interactions*, 3rd edition. Sandy (OR): Eclectic Medical Publications; 2001.

Buckley MS, Goff AD, Knapp WE. Fish oil interaction with warfarin. *Annals of Pharmacotherapy* 2004;38(1):50-53.

Buckley R, Shewring B, Turner R, Yaqoob P, Minihane AM. Circulating triacylglycerol and apoE levels in response to EPA and docosahexaenoic acid supplementation in adult human subjects. *The British Journal of Nutrition* 2004;92(3):477-483.

Burgess JR, Stevens L, Zhang W, Peck L. Long-chain polyunsaturated fatty acids in children with attention-deficit hyperactivity disorder. *The American Journal of Clinical Nutrition* 2000; 71(Suppl 1):327S-30S.

Cairns JA, Gill J, Morton B, Roberts R, Gent M, Hirsh J, Holder D, Finnie K, Marquis JF, Naqvi S, Cohen E. Fish oils and low-molecular-weight heparin for the reduction of restenosis after percutaneous transluminal coronary angioplasty. The EMPAR Study. *Circulation* 1996; 94(7):1553-1560.

Calder PC. n-3 polyunsaturated fatty acids, inflammation, and inflammatory diseases. *The American Journal of Clinical Nutrition* 2006;83(Suppl 6):1505S-1519S.

Calder PC. n-3 fatty acids and cardiovascular disease: evidence explained and mechanisms explored. *Clinical Science* 2004;107(1):1-11.



Calder PC. Polyunsaturated fatty acids, inflammation, and immunity. *Lipids* 2001;36(9):1007-1024.

Calò L, Bianconi L, Colivicchi F, Lamberti F, Loricchio ML, de Ruvo E, Meo A, Pandozi C, Staibano M, Santini M. N-3 fatty acids for the prevention of atrial fibrillation after coronary artery bypass surgery: a randomized, controlled trial. *Journal of the American College of Cardiology* 2005;45(10):1723-1728.

Calon F, Lim GP, Yang F, Morihara T, Teter B, Ubada O, Rostaing P, Triller A, Salem N Jr, Ashe KH, Frautschy SA, Cole GM. Docosahexaenoic acid protects from dendritic pathology in an Alzheimer's disease mouse model. *Neuron* 2004;43(5):596-599.

Carlson SE. Arachidonic acid status of human infants: influence of gestational age at birth and diets with very long chain n-3 and n-6 fatty acids. *The Journal of Nutrition* 1996;126(Suppl 4):1092S-1098S.

Carlson SE, Werkman SH, Peeples JM, Cooke RJ, Tolley EA. Arachidonic acid status correlates with first year growth in preterm infants. *Proceedings of the National Academy of Sciences* 1993; 90(3):1073-1077.

Carroll DN, Roth MT. Evidence for the cardioprotective effects of omega-3 fatty acids. *The Annals of Pharmacotherapy* 2002;36(12):1950-1956.

Cazzola R, Russo-Volpe S, Miles EA, Rees D, Banerjee T, Roynette CE, Wells SJ, Goua M, Wahle KW, Calder PC, Cestaro B. Age- and dose-dependent effects of an eicosapentaenoic acid- rich oil on cardiovascular risk factors in healthy male subjects. *Atherosclerosis* 2007; 193(1):159-167.

Chee KM, Gong JX, Rees DM, Meydani M, Ausman L, Johnson J, Siguel EN, Schaefer EJ. Fatty acid content of marine oil capsules. *Lipids* 1990;25(9):523-528.

Cleary MA, Feillet F, White FJ, Vidailhet M, MacDonald A, Grimsley A, Maurin N, de Baulny HO, Rutherford PJ. Randomised controlled trial of essential fatty acid supplementation in phenylketonuria. *European Journal of Clinical Nutrition* 2006;60(7):915-920.

Cleland LG, French JK, Betts WH, Murphy GA, Elliot MJ. Clinical and biochemical effects of dietary fish oil supplements in rheumatoid arthritis. *The Journal of Rheumatology* 1988; 15(10):1471-1475.

Colter AL, Cutler C, Meckling KA. Fatty acid status and behavioural symptoms of Attention Deficit Hyperactivity Disorder in adolescents: a case-control study. *Nutrition Journal* 2008;7:8.

Conklin SM, Gianaros PJ, Brown SM, Yao JK, Hariri AR, Manuck SB, Muldoon MF. Long-chain omega-3 fatty acid intake is associated positively with corticolimbic gray matter volume in healthy adults. *Neuroscience Letter* 2007;421(3):209-212.



Connor WE, DeFrancesco CA, Connor SL. N-3 fatty acids from fish oil: Effects on plasma lipoproteins and hypertriglyceridemic patients. *Annals of the New York Academy of Sciences* 1993;683:16-34.

Connor WE, Prince MJ, Ullmann D, Riddle M, Hatcher L, Smith FE, Wilson D. The hypotriglyceridemic effect of fish oil in adult-onset diabetes without adverse glucose control. *Annals of the New York Academy of Science* 1993;683(1):337-340.

Conquer JA, Cheryk LA, Chan E, Gentry PA, Holub BJ. Effect of supplementation with dietary seal oil on selected cardiovascular risk factors and hemostatic variables in healthy male subjects. *Thrombosis Research* 1999;96(3):239-250.

Cunnane S, Drevon CA, Harris B, Sinclair A, Spector A. Recommendations for intake of polyunsaturated fatty acids in healthy adults. Devon (GB): International Society for the Study of Fatty Acids and Lipids; 2004. [Accessed 2023 March 07]. Available from: <https://www.ojp.gov/ncjrs/virtual-library/abstracts/recommendations-intake-polyunsaturated-fatty-acids-healthy-adults>.

Dangour AD, Uauy R. N-3 long-chain polyunsaturated fatty acids for optimal function during brain development and ageing. *Asian Pacific Journal of Clinical Nutrition* 2008;17(Suppl 1):185- 188.

De Groot RHM, Hornstra G, Jolles J. Exploratory study into the relation between plasma phospholipid fatty acid status and cognitive performance. *Prostaglandins, Leukotrienes, Essential Fatty Acids* 2007;76(3):165-172.

Deutch B, Jørgensen EB, Hansen JC. Menstrual discomfort in Danish women reduced by dietary supplements of omega-3 PUFA and B₁₂ (fish oil or seal oil capsules). *Nutrition Research* 2000. 20(5):621-631.

Dokholyan RS, Albert CM, Appel LJ, Cook NR, Whelton PK, Hennekens CH. A trial of omega-3 fatty acids for prevention of hypertension. *The American Journal of Cardiology* 2004; 93(8):1041-1043.

Dunstan JA, Mori TA, Barden A, Beilin LJ, Taylor AL, Holt PG, Prescott SL. Fish oil supplementation in pregnancy modifies neonatal allergen-specific immune responses and clinical outcomes in infants at high risk of atopy: a randomized, controlled trial. *Journal of Allergy and Clinical Immunology* 2003;112(6):1178-1184.

Dunstan JA, Roper J, Mitoulas L, Hartmann PE, Simmer K, Prescott SL. The effect of supplementation with fish oil during pregnancy on breast milk immunoglobulin A, soluble CD14, cytokine levels, and fatty acid composition. *Clinical and Experimental Allergy* 2004;34(8):1237-1242.

EFSA 2011. Scientific Opinion on the substantiation of health claims related to docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA) and gamma-linolenic acid (GLA) and contribution to



normal cognitive function (ID 532) and maintenance of normal bone (ID 642, 697, 1552) pursuant to Article 13(1) of Regulation (EC) No 1924/2006. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). EFSA Journal 2011;9(6):2224. [Accessed 2023 March 07]. Available from: <http://www.efsa.europa.eu/en/efsajournal/doc/2224.pdf>.

Engeset D, Alsaker E, Lund E, Welch A, Khaw KT, Clavel-Chapelon F, Thiébaud A, Chajès V, Key TJ, Allen NE, Amiano P, Dorronsoro M, Tjønneland A, Stripp C, Peeters PH, van Gils CH, Chirlaque MD, Nagel G, Linseisen J, Ocké MC, Bueno-de-Mesquita HB, Sacerdote C, Tumino R, Ardanaz E, Sánchez MJ, Panico S, Palli D, Trichopoulou A, Kalapothaki V, Benetou V, Quirós JR, Agudo A, Overvad K, Bjerregaard L, Wirfält E, Schulz M, Boeing H, Slimani N, Riboli E. Fish consumption and breast cancer risk. The European Prospective Investigation into Cancer and Nutrition (EPIC). *International Journal of Cancer* 2006;119(1):175-182.

Engler MM, Engler MB, Malloy MJ, Paul SM, Kulkarni KR, Mietus-Snyder ML. Effect of docosahexaenoic acid on lipoprotein subclasses in hyperlipidemic children (the EARLY study). *American Journal of Cardiology* 2005;95(7):869-871.

Eritsland J. Safety considerations of polyunsaturated fatty acids. *The American Journal of Clinical Nutrition* 2000;71(Suppl 1):197S-201S.

Eritsland J, Arnesen H, Seljeflot I, Høstmark AT. Long-term metabolic effects of n-3 polyunsaturated fatty acids in patients with coronary artery disease. *The American Journal of Clinical Nutrition* 1995;61(4):831-836.

Eritsland J, Arnesen H, Seljeflot I, Kierulf P. Long-term effects of n-3 polyunsaturated fatty acids on haemostatic variables and bleeding episodes in patients with coronary artery disease. *Blood Coagulation and Fibrinolysis* 1995;6(1):17-22.

Eritsland J, Seljeflot I, Abdelnoor M, Arnesen H, Torjesen PA. Long-term effects of n-3 fatty acids on serum lipids and glycemic control. *Scandinavian Journal of Clinical and Laboratory Investigation* 1994;54(4):273-280.

European Food Safety Authority. Scientific substantiation of a health claim related to Docosahexaenoic Acid (DHA) and Arachidonic Acid (ARA) and support of the neural development of the brain and eyes pursuant to Article 14 of Regulation (EC) No 1924/2006. *The EFSA Journal* 2008;794:1-11.

European Food Safety Authority. Scientific substantiation of a health claim related to α -linolenic acid and linoleic acid and growth and development of children pursuant to Article 14 of Regulation (EC) No 1924/2006. *The EFSA Journal* 2008;783:1-9.

Finnegan YE, Howarth D, Minihane AM, Kew S, Miller GJ, Calder PC, Williams CM. Plant and marine derived (n-3) polyunsaturated fatty acids do not affect blood coagulation and fibrinolytic factors in moderately hyperlipidemic humans. *The Journal of Nutrition* 2003;133(7):2210-2213.

Fortin PR, Lew RA, Liang MH, Wright EA, Beckett LA, Chalmers TC, Sperling RI. Validation of a meta-analysis: the effects of fish oil in rheumatoid arthritis. *The Journal of Clinical*

Epidemiology 1995;48(11):1379-1390.

Frais AT. Depression and the causal role of specific memory system degenerations: Link may be supported by reported therapeutic benefits of omega 3 fatty acids. *Medical Hypothesis* 2007; 69(1):67-69.

Frangou S, Lewis M, McCrone P. Efficacy of ethyl-eicosapentaenoic acid in bipolar depression: randomised double-blind placebo-controlled study. *British Journal of Psychiatry* 2006;188:46-50.

Franzen D, Schannwell M, Oette K, Höpp HW. A prospective, randomized, and double-blind trial on the effect of fish oil on the incidence of restenosis following PTCA. *Catheterization and Cardiovascular Diagnosis* 1993;28(4):301-310.

Freese R, Mutanen N. Alpha-linolenic acid and marine long-chain n-3 fatty acids differ only slightly in their effects on hemostatic factors in healthy subjects. *The American Journal of Clinical Nutrition* 1997;66(3):591-598.

Fregni F, Schachter SC, Pascual-Leone A. Review: Transcranial magnetic stimulation treatment for epilepsy: Can it also improve depression and vice versa? *Epilepsy and Behavior* 2005; 7(2):182-189.

Freund-Levi Y, Eriksdotter-Jonhagen M, Cederholm T, Basun H, Faxen-Irving G, Garlind A, Vedin I, Vessby B, Wahlund LO, Palmblad J. ω -3 fatty acid treatment in 174 patients with mild to moderate Alzheimer disease: omegaAD study. *Archives of Neurology* 2006;63(10):1402-1408.

Friedberg CE, Janssen MJ, Heine RJ, Grobbee DE. Fish oil and glycemic control in diabetes. A meta-analysis. *Diabetes Care* 1998;21(4):494-500.

Fux M, Benjamin J, Nemets B. A placebo-controlled crossover trial of adjunctive EPA in OCD. *Journal of Psychiatric Research* 2004;38(3):323-325.

Gadoth N. On fish oil and omega-3 supplementation in children: The role of such supplementation on attention and cognitive dysfunction. *Brain and Development* 2008; 30(5):309-312.

Gapinski JP, VanRuiswyk JV, Heudebert GR, Schectman GS. Preventing restenosis with fish oils following coronary angioplasty: a meta-analysis. *Archives of Internal Medicine* 1993; 153(13):1595-1601.

Government of Canada 2023a. Cannabis Act. [Accessed 2023 March 07]. Available from: <https://laws-lois.justice.gc.ca/eng/acts/C-24.5/>

Government of Canada 2023b. Industrial Hemp Regulations. [Accessed 2023 March 07]. Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-145/>

Government of Canada 2023. Natural Health Products Regulations. [Accessed 2023 March 07].

Available from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-196/?showtoc=&instrumentnumber=SOR-2003-196>

Geelen A, Brouwer IA, Schouten EG, Maan AC, Katan MB, Zock PL. Effects of n-3 fatty acids from fish on premature ventricular complexes and heart rate in humans. *The American Journal of Clinical Nutrition* 2005;81(2):416-420.

Geleijnse JM, Giltay EJ, Grobbee DE, Donders AR, Kok FJ. Blood pressure response to fish oil supplementation: metaregression analysis of randomized trials. *Journal of Hypertension* 2002; 20(8):1493-1499.

Geusens P, Wouters C, Nijs J, Jiang Y, Dequeker J. Long-term effect of omega-3 fatty acid supplementation in active rheumatoid arthritis: a 12-month, double-blind, controlled study. *Arthritis & Rheumatism* 1994;37(6):824-829.

Goodnight SH, Harris WS, Connor WE. The effects of dietary omega-3 fatty acids on platelet composition and function in man: a prospective, controlled study. *Blood* 1981;58(5):880-885.

Grimsgaard S, Bonna KH, Hansen JB, Nordøy A. Highly purified eicosapentaenoic acid and docosahexaenoic acid in humans have similar triacylglycerol-lowering effects but divergent effects on serum fatty acids. *The American Journal of Clinical Nutrition* 1997;66(3):649-659.

Guivernau N, Meza N, Barja P, Roman O. Clinical and experimental study on the long-term effect of dietary gamma-linolenic acid on plasma lipids, platelet aggregation, thromboxane formation, and prostacyclin production. *Prostaglandins, Leukotrienes, and Essential Fatty Acids* 1994;51(5):311-316.

Haglund O, Luostarinen R, Wallin R, Wibell L, Saldeen T. The effects of fish oil on triglycerides, cholesterol, fibrinogen and malondialdehyde in humans supplemented with vitamin E. *The Journal of Nutrition* 1991;121(2):165-169.

Hakkarainen R, Partonen T, Haukka J, Virtamo J, Albanes D, Lonnqvist J. Food and nutrient intake in relation to mental well being. *Nutritional Journal* 2004;3:14.

Halldorsson TI, Meltzer HM, Thorsdottir I, Knudsen V, Olsen SF. Is high consumption of fatty fish during pregnancy a risk factor for fetal growth retardation? A study of 44,824 Danish pregnant women. *American Journal of Epidemiology* 2007;166(6):687-696.

Halliwel B, Chirico S. Lipid peroxidation: its mechanism, measurement, and significance. *The American Journal of Clinical Nutrition* 1993;57(Suppl 5):715S-725S.

Hamazaki T, Sawazaki S, Nagao Y, Kuwamori T, Yazawa K, Mizushima Y, Kobayashi M. Docosahexaenoic acid does not affect aggression of normal volunteers under nonstressful conditions. A randomized, placebo-controlled, double-blind study. *Lipids* 1998;33(7):663-667.

Hamazaki T, Sawazaki S, Itomura M, Asaoka E, Nagao Y, Nishimura N, Yazawa K, Kuwamori T, Kobayashi M. The effect of docosahexaenoic acid on aggression in young adults: a placebo-

controlled double-blind study. *Journal Clinical Investigation* 1996;97(4):1129-1134.

Harel Z, Biro FM, Kottenhahn RK, Rosenthal SL. Supplementation with omega-3 polyunsaturated fatty acids in the management of dysmenorrhea in adolescents. *The American Journal of Obstetrics and Gynecology* 1996;174(4):1335-1338.

Harris WS. International recommendations for consumption of long-chain omega-3 fatty acids. *Journal of Cardiovascular Medicine* 2007;8(Suppl 1):S50-S52.

Harrison N, Abhyankar B. The mechanism of action of omega-3 fatty acids in secondary prevention post-myocardial infarction. *Current Medical Research and Opinion* 2005;21(1):95-100.

Health Canada 2018. Health products containing cannabis or for use with cannabis: Guidance for the Cannabis Act, the Food and Drugs Act, and related regulations. [Accessed 2021 June 29]. Available from: <https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/applications-submissions/guidance-documents/guidance-cannabis-act-food-and-drugs-act-related-regulations/document.html>

Health Canada 2012. Novel food information - Camelina oil. [Accessed 2014 September 29]. Available from: <http://www.hc-sc.gc.ca/fn-an/gmf-agm/appro/camelina-cameline-eng.php>

Health Canada 2009. The Canadian Nutrient File. Ottawa (ON): Health Canada. [Accessed 2023 March 07]. Available from: http://www.hc-sc.gc.ca/fn-an/nutrition/fiche_nutri-data/cnf_aboutus-aproposdenous_fcen-eng.php.

He K, Song Y, Daviglius ML, Liu K, Van Horn L, Dyer AR, Goldbourt U, Greenland P. Fish consumption and incidence of stroke: a meta-analysis of cohort studies. *Stroke* 2004; 35(7):1538-1542.

Hendler SS, Rorvik D, editors. *PDR for Nutritional Supplements*, 1st edition. Montvale (NJ): Thomson PDR; 2001.

Hibbeln JR, Ferguson TA, Blasbalg TL. Omega-3 fatty acid deficiencies in neurodevelopment, aggression and autonomic dysregulation: opportunities for intervention. *International Review of Psychiatry* 2006;18(2):107-118.

Hjerkinn EM, Seljeflot I, Ellingsen I, Berstad P, Hjermmann I, Sandvik L, Arnesen H. Influence of long-term intervention with dietary counselling, long-chain n-3 fatty acid supplements, or both on circulating markers of endothelial activation in men with long-standing hyperlipidemia. *The American Journal of Clinical Nutrition* 2005;81(3):583-589.

Hodge L, Salome CM, Hughes JM, Liu-Brennan D, Rimmer J, Allman M, Pang D, Armour C, Woolcock AJ. Effect of dietary intake of omega-3 and omega-6 fatty acids on severity of asthma in children. *European Respiratory Journal* 1998;11(2):361-365.

Hodge W, Barnes D, Schachter HM, Pan Y, Lowcock EC, Zhang L, Sampson M, Morrison A, Tran K, Miguelez M, Lewin G. Effects of Omega-3 Fatty Acids on Eye Health. Summary, Evidence Report/Technology Assessment No. 117. AHRQ No. 05-E008-2. Rockville (MD): Agency for Healthcare Research and Quality; 2005.

Hoffman DR, Locke KG, Wheaton DH, Fish GE, Spencer R, Birch DG. A randomized, placebo-controlled clinical trial of docosahexaenoic acid supplementation for X-linked retinitis pigmentosa. *American Journal of Ophthalmology* 2004;137(4):704-718.

Holguin F, Téllez-Rojo MM, Lazo M, Mannino D, Schwartz J, Hernández M, Romieu I. Cardiac autonomic changes associated with fish oil vs soy oil supplementation in the elderly. *Chest* 2005; 127(4):1102-1107.

Hornstra G. Essential fatty acids in mothers and their neonates. *The American Journal of Clinical Nutrition* 2000;71(Suppl 5):1262S-1269S.

Horrobin DF. Essential fatty acid metabolism and its modification in atopic eczema. *The American Journal of Clinical Nutrition* 2000;71(Suppl 1):367S-372S.

Horrobin DF. Interactions between n-3 and n-6 essential fatty acids (EFAs) in the regulation of cardiovascular disorders and inflammation. Prostaglandins, Leukotrienes, and Essential Fatty Acids 1991;44(2):127-31.

Iacoviello L, Amore C, De Curtis A, Tacconi MT, de Gaetano G, Cerletti C, Donati MB. Modulation of fibrinolytic response to venous occlusion in humans by a combination of low-dose aspirin and n-3 polyunsaturated fatty acids. *Arteriosclerosis, Thrombosis and Vascular Biology* 1992;12(10):1191-1197.

Ikeda I, Yoshida H, Tomooka M, Yosef A, Imaizumi K, Tsuji H, Seto A. Effects of long-term feeding of marine oils with different positional distribution of eicosapentaenoic and docosahexaenoic acids on lipid metabolism, eicosanoid production, and platelet aggregation in hypercholesterolemic rats. *Lipids* 1998;33(9):897-904.

Innis SM. Dietary (n-3) fatty acids and brain development. *The Journal of Nutrition* 2007; 137(4):855-859.

Institute of Medicine (IOM). Committee on Nutrient Relationships in Seafood Selection to balance Benefits and Risks, Food and Nutrition Board, Seafood Choices: Balancing Benefits and Risks. Washington (DC): National Academies Press; 2007.

Iso H, Rexrode KM, Stampfer MJ, Manson JE, Colditz GA, Speizer FE, Hennekens CH. Intake of fish and omega-3 fatty acids and risk of stroke in women. *JAMA: The Journal of the American Medical Association* 2001;285(3):304-312.

Johansen O, Brekke M, Seljeflot I, Abdelnoor M, Arnesen H. n-3 fatty acids do not prevent restenosis after coronary angioplasty: results from the CART study. *Journal of the American*

College of Cardiology 1999;33(6):1619-1626.

Johnson EJ, Chung HY, Caldarella SM, Snodderly DM. The influence of supplemental lutein and docosahexaenoic acid on serum, lipoproteins, and macular pigmentation. *The American Journal of Clinical Nutrition* 2008;87(5):1521-1529.

Kalmijn S, van Boxten MP, Ocke M, Verschuren WMM, Kromhout D, Launer LJ. Dietary intake of fatty acids and fish in relation to cognitive performance at middle age. *Neurology* 2004;62(2):275-280.

Kalmijn S, Feskens EJ, Launer LJ, Kromhout D. Polyunsaturated fatty acids, antioxidants, and cognitive function in very old men. *American Journal of Epidemiology* 1997;145(1):33-41.

Kaul U, Sanghvi S, Bahl VK, Dev V, Wasir HS. Fish oil supplements for prevention of restenosis after coronary angioplasty. *International Journal of Cardiology* 1992;35(1):87-93.

Kaur G, Cameron-Smith D, Garg M, Sinclair AJ. Docosapentaenoic acid (22:5n-3): a review of its biological effects. *Progress in Lipid Research* 2011;50(1):28-34.

Kelley DS, Siegel D, Vemuri M, Mackey BE. Docosahexaenoic acid supplementation improves fasting and postprandial lipid profiles in hypertriglyceridemic men. *The American Journal of Clinical Nutrition* 2007;86(2):324-333.

Kernoff PBA, Willis AL, Stone KJ, Davies JA, McNicol GP. Antithrombotic potential of dihomo-gamma-linolenic acid in man. *British Medical Journal* 1977;2(6100):1441-1444.

Khan F, Elherik K, Bolton-Smith C, Barr R, Hill A, Murrie I, Belch JJ. The effects of dietary fatty acid supplementation on endothelial function and vascular tone in healthy subjects. *Cardiovascular Research* 2003;59(4):955-962.

Kidd PM. Omega-3 DHA and EPA for cognition, behavior, and mood: clinical findings and structural-functional synergies with cell membrane phospholipids. *Alternative Medical Review* 2007;12(3):207-227.

Kjeldsen-Kragh J, Lund JA, Riise T, Finnanger B, Haaland K, Finstad R, Mikkelsen K, Førre Ø. 1992. Dietary omega-3 fatty acid supplementation and naproxen treatment in patients with rheumatoid arthritis. *Journal of Rheumatology* 19(10):1531-1536.

Kotani S, Sakaguchi E, Warashina S, Matsukawa N, Ishikura Y, Kiso Y, Sakakibara M, Yoshimoto T, Guo J, Yamashima T. 2006. Dietary supplementation of arachidonic and docosahexaenoic acids improves cognitive dysfunction. *Neuroscience Research* 56(2):159-164.

Kremer JM, Bigauoette J, Michalek AV, Timchalk MA, Lininger L, Rynes RI, Huyck C, Zieminski J, Bartholomew LE. Effects of manipulation of dietary fatty acids on clinical manifestations of rheumatoid arthritis. *The Lancet* 1985;1(8422):184-187.



Kremer JM, Lawrence DA, Jubiz W, DiGiacomo R, Rynes R, Bartholomew LE, Sherman M. Dietary fish oil and olive oil supplementation in patients with rheumatoid arthritis: clinical and immunologic effects. *Arthritis and Rheumatism* 1990;33(6):810-819.

Kremer JM, Lawrence DA, Petrillo GF, Litts LL, Mullaly PM, Rynes RI, Stocker RP, Parhami N, Greenstein NS, Fuchs BR, Mathur A, Robinson DR, Sperling RI, Bigaouette J. Effects of high-dose fish oil on rheumatoid arthritis after stopping nonsteroidal anti-inflammatory drugs. *Arthritis & Rheumatism* 1995;38(8):1107-1114.

Krokan HE, Bjerve KS, Mork E. The enteral bioavailability of eicosapentaenoic acid and docosahexaenoic acid is as good from ethyl esters as from glyceryl esters in spite of lower hydrolytic rates by pancreatic lipase in vitro. *Biochimica et Biophysica Acta* 1993;1168(1):59-67.

Kuhnt K, Degen C, Jaudszus A, Jahreis G. Searching for health beneficial n-3 and n-6 fatty acids in plant seeds. *European Journal of Lipid Science & Technology* 2012;114(2):153-160.

Kyrozis A, Psaltopoulou T, Stathopoulos P, Trichopoulos D, Vassilopoulos D, Trichopoulou A. Dietary lipids and geriatric depression scale score among elders: the EPIC-Greece cohort. *Journal of Psychiatric Research* 2009;43(8):763-769.

Laidlaw M and Holub B. Effects of supplementation with fish oil-derived n-3 fatty acids and gamma-linolenic acid on circulating plasma lipids and fatty acid profiles in women. *The American Journal of Clinical Nutrition* 2003;77(1):37-42.

Lau CS, McLaren M, Belch JJ. Effects of fish oil on plasma fibrinolysis in patients with mild rheumatoid arthritis. *Clinical and Experimental Rheumatology* 1995;13(1):87-90.

Lauritzen L, Kjaer TM, Fruekilde MB, Michaelsen KF, Frokiaer H. Fish oil supplementation of lactating mothers affects cytokine production in 2 ½-year-old children. *Lipids* 2005;40(7):669-676.

Lawson LD, Hughes BG. Absorption of eicosapentaenoic acid and docosahexaenoic acid from fish oil triacylglycerols or fish oil ethyl esters co-ingested with a high-fat meal. *Biochemical and Biophysical Research Communications* 1988;156(2):960-963.

Leaf A, Jorgensen MB, Jacobs AK, Cote G, Schoenfeld DA, Scheer J, Weiner BH, Slack JD, Kellett MA, Raizner AE, Weber PC, Mahrer PR, Rossouw JE. Do fish oils prevent coronary angioplasty? *Circulation* 1994;90(5):2248-2257.

Leigh-Firbank EC, Minihane AM, Leake DS, Wright JW, Murphy MC, Griffin BA, Williams CM. Eicosapentaenoic acid and docosahexaenoic acid from fish oils: differential associations with lipid responses. *The British Journal of Nutrition* 2002;87(5):435-445.

Leng GC, Lee AJ, Fowkes FG, Jepson RG, Lowe GD, Skinner ER, Mowat BF. Randomized controlled trial of gamma-linolenic acid and eicosapentaenoic acid in peripheral arterial disease.

Clinical Nutrition 1998;17(6):265-271.

Leventhal LJ, Boyce EG, Zurier RB. Treatment of rheumatoid arthritis with gammalinolenic acid. *Annals of Internal Medicine* 1993;119(9):867-873.

Lewin GA, Schachter HM, Yuen D, Merchant P, Mamaladze V, Tsertsvadze A, Clifford T, Kourad K, Barnes D, Armour T, Yazdi F, MacNeil J, McGahern C, Senechal H, Fang M, Barrowman N, Sampson M, Morrison A, Elien D, Saint-Martin M, Sambasivan A, Lowcock E, Pan Y, Lemyre B. Effects of Omega-3 Fatty Acids on Child and Maternal Health. Summary, Evidence Report/Technology Assessment No. 118. AHRQ No. 05-E025-2. Rockville (MD): Agency for Healthcare Research and Quality; 2005.

Li D, Sinclair A, Wilson A, Nakkote S, Kelly F, Abedin L, Mann N, Turner A. Effect of dietary alpha-linolenic acid on thrombotic risk factors in vegetarian men. *The American Journal of Clinical Nutrition* 1999;69(5):872-82.

Linday LA, Dolitsky JN, Shindlecker RD. Nutritional supplements as adjunctive therapy for children with chronic/recurrent sinusitis: pilot research. *International Journal of Pediatric Otorhinolaryngology* 2004;68(6):785-793.

Llorente AM, Jensen CL, Voigt RG, Fraley JK, Berretta MC, Heird WC. Effect of maternal docosahexaenoic acid supplementation on postpartum depression and information processing. *American Journal Obstetrics and Gynecology* 2003;188(5):1348-1353.

Logan AC. Review: omega-3 fatty acids and major depression: a primer for the mental health professional. *Lipids in Health and Disease* 2004;3:25.

Lorenz R, Spengler U, Fischer S, Duhm J, Weber PC. Platelet function, thromboxanes formation and blood pressure control during supplementation of the Western diet with cod liver oil. *Circulation* 1983;67(3):504-511.

Lovell CR, Burton JL, Horrobin DF. Treatment of atopic eczema with evening primrose oil [letter]. *The Lancet* 1981;317(8214):278.

MacLean CH, Issa AM, Newberry SJ, Mojica WA, Morton SC, Garland RH, Hilton LG, Traina SB, Shekelle PG. Effects of Omega-3 Fatty Acids on Cognitive Function with Aging, Dementia, and Neurological Diseases. Summary, Evidence Report/Technology Assessment No. 114. AHRQ No. 05-E011-2. Rockville (MD): Agency for Healthcare Research and Quality; 2005.

MacLean CH, Mojica WA, Morton SC, Pencharz J, Hasenfeld Garland R, Tu W, Newberry SJ, Jungvig LK, Grossman J, Khanna P, Rhodes S, Shekelle P. Effects of Omega-3 Fatty Acids on Lipids and Glycemic Control in type II Diabetes and the Metabolic Syndrome and on Inflammatory Bowel Disease, Rheumatoid Arthritis, Renal Disease, Systemic Lupus Erythematosus, and Osteoporosis. Summary, Evidence Report/Technology Assessment No. 89. AHRQ No. 04-E012-2. Rockville (MD): Agency for Healthcare Research and Quality; 2004.

MacLean CH, Newberry SJ, Mojica WA, Issa A, Khanna P, Lim YW, Morton SC, Suttorp M, Tu W, Hilton LG, Garland RH, Traina SB, Shekelle PG. Effects of Omega-3 Fatty Acids on Cancer. Summary, Evidence Report/Technology Assessment No. 113. AHRQ No. 05-E010-2. Rockville (MD): Agency for Healthcare Research and Quality; 2005.

Maes M, Christophe A, Delanghe J, Altamura C, Neels H, Meltzer HY. Lowered omega-3 polyunsaturated fatty acids in serum phospholipids and cholesterol esters of depressed patients. *Psychiatry Research* 1999;85(3):275-291.

Maes M, Mihaylova I, Kubera M, Bosmans E. Why fish oils may not always be adequate treatments for depression or other inflammatory illnesses: docosahexaenoic acid, an omega-3 polyunsaturated fatty acid, induces a Th-1-like immune response. *Neuro Endocrinology Letters* 2007;28(6):875-880.

Maes M, Mihaylova I, Leunis JC. In chronic fatigue syndrome, the decreased levels of omega-3 poly-unsaturated fatty acids are related to lowered serum zinc and defects in T cell activation. *Neuro Endocrinology Letters* 2005;26(6):745-751.

Maillard V, Bougnoux P, Ferrari P, Jourdan ML, Pinault M, Lavillonnière M, Body G, Le Floch O, Chajès V. N-3 and n-6 fatty acids in breast adipose tissue and relative risk of breast cancer in a case-control study in Tours, France. *International Journal of Cancer* 2002;98(1):78-83.

Makrides M. Commentary: outcomes for mothers and their babies: do n-3 long-chain polyunsaturated fatty acids and seafoods make a difference? *Journal of the American Dietetic Association* 2008;108(10):1622-1626.

Manku MS, Horrobin DF, Morse N, Kyte V, Jenkins K. Reduced levels of prostaglandin precursors in the blood of atopic patients: defective delta-6-desaturase function as a biochemical basis for atopy. *Prostaglandins, Leukotrienes and Medicine* 1982;9(6):615-628.

Manku MS, Horrobin DF, Morse NL, Wright S, Burton JL. Essential fatty acids in the plasma phospholipids of patients with atopic eczema. *The British Journal of Dermatology* 1984;110(6):643-648.

Mann NJ, O'Connell SL, Baldwin KM, Singh I, Meyer BJ. Effects of seal oil and tuna-fish oil on platelet parameters and plasma lipid levels in healthy subjects. *Lipids* 2010;45(8):669-81.

Marangell LB, Martinez JM, Zboyan HA, Chong H, Puryear LJ. Omega-3 fatty acids for the prevention of postpartum depression: negative data from a preliminary, open-label pilot study. *Depression and Anxiety* 2004;19(1):20-23.

Marangell LB, Martinez JM, Zboyan HA, Kertz B, Kim HF, Puryear LJ. A double-blind, placebo-controlled study of the omega-3 fatty acid docosahexaenoic acid in the treatment of major depression. *American Journal Psychiatry* 2003;160(5):996-998.

Maresta A, Balduccelli M, Varani E, Marzilli M, Galli C, Heiman F, Lavezzari M, Stragliotto E,



De Caterina R; ESPRIT Investigators. Prevention of postcoronary angioplasty restenosis by omega-3 fatty acids: main results of the Esapent for Prevention of Restenosis Italian Study (ESPRIT). *American Heart Journal* 2002;143(6):E5.

Martin RE, Carter EP, Flick GJ, Davis LM, editors. *Marine & Freshwater Products Handbook*. Lancaster (PA): Technomic Publishing Company, Inc.;2000.

McCann JC, Ames BN. Is docosahexaenoic acid, an n-3 long-chain polyunsaturated fatty acid, required for development of normal brain function? An overview of evidence from cognitive and behavioral tests in humans and animals. *The American Journal of Clinical Nutrition* 2005;82(2):281-295.

McFayden IJ, Forrest AP, Chetty U. Cyclical breast pain—some observations and the difficulties in treatment. *The British Journal Clinical Practice* 1992;46(3):161-164.

McGregor L, Smith AD, Sidey M, Belin J, Zilkha KJ, McGregor JL. Effects of dietary linoleic acid and gamma linolenic acid on platelets of patients with multiple sclerosis. *Acta Neurologica Scandinavica* 1989;80(1):23-27.

McGuffin M, Hobbs C, Upton R, Goldberg A, editors. *American Herbal Products Association's Botanical Safety Handbook*. Boca Raton (FL): CRC Press.; 1997.

Meydani M, Natiello F, Goldin B, Free N, Woods M, Schaefer E, Blumberg JB, Gorbach SL. Effect of long-term fish oil supplementation on vitamin E status and lipid peroxidation in women. *The Journal of Nutrition* 1991;121(4):484-491.

Mickleborough TD, Ionescu AA, Rundell KW. Omega-3 fatty acids and airway hyperresponsiveness in asthma. *The Journal of Alternative and Complementary Medicine* 2004; 10(6):1067-1075.

Mickleborough TD, Lindley MR, Ionescu AA, Fly AD. Protective effect of fish oil supplementation on exercise-induced bronchoconstriction in asthma. *Chest* 2006;129(1):39-49.

Mihrshahi S, Peat JK, Webb K, Oddy W, Marks GB, Mellis CM. Effect of omega-3 fatty acid concentrations in plasma on symptoms of asthma at 18 months of age. *Pediatric Allergy and Immunology* 2004;15(6):517-522.

Miles EA, Banerjee T, Calder PC. Self-reported health problems in young male subjects supplementing their diet with oils rich in eicosapentaenoic, gamma-linolenic and stearidonic acids. *Prostaglandins, Leukotrienes, and Essential Fatty Acids* 2006;75(1):57-60.

Miller LG. Herbal medicinals: selected clinical considerations focusing on known or potential drug-herb interactions. *Archives of Internal Medicine* 1998;158(20):2200-2211.

Miller CC, Tang W, Ziboh VA, Fletcher MP. Dietary supplementation with ethyl ester concentrates of fish oil (n-3) and borage oil (n-6) polyunsaturated fatty acids induces epidermal



generation of local putative anti-inflammatory metabolites. *The Journal of Investigative Dermatology* 1991;96(1):98-103.

Mills S, Bone K. *Principles and Practice of Phytotherapy*. Toronto (ON): Churchill Livingstone;2000.

Montgomery C, Speake BK, Cameron A, Sattar N, Weaver LT. Maternal docosahexaenoic acid supplementation and fetal accretion. *The British Journal of Nutrition* 2003;90(1):135-140.

Moore CS, Bryant SP, Mishra GD, Krebs JD, Browning LM, Miller GJ, Jebb SA. Oily fish reduces plasma triacylglycerols: a primary prevention study in overweight men and women. *Nutrition* 2006;22(10):1012-1024.

Mori TA, Bao DQ, Burke V, Puddey IB, Beilin LJ. Docosahexaenoic acid but not eicosapentaenoic acid lowers ambulatory blood pressure and heart rate in humans. *Hypertension* 1999;34(2):253-260.

Mori TA, Burke V, Puddey IB, Watts GF, O'Neal DN, Best JD, Beilin LJ. Purified eicosapentaenoic and docosahexaenoic acids have differential effects on serum lipids and lipoproteins, LDL particle size, glucose, and insulin in mildly hyperlipidemic men. *The American Journal of Clinical Nutrition* 2000;71(5):1085-1094.

Morris MC, Sacks F, Rosner B. Regulation of blood pressure: does fish oil lower blood pressure? A meta-analysis of controlled trials. *Circulation* 1993;8(2):523-533.

Morse NL, Clough PM. A meta-analysis of randomized, placebo-controlled clinical trials of efamol evening primrose oil in atopic eczema. Where do we go from here in light of more recent discoveries? *Current Pharmaceutical Biotechnology* 2006;7(6):24-503.

Morse PF, Horrobin DF, Manku MS, Stewart JC, Allen R, Littlewood S, Wright S, Burton J, Gould DJ, Holt PJ, Jansen CT, Mattila L, Meigel W, Dettke TH, Wexler D, Guenther L, Bordoni A, Patrizi A. Meta-analysis of placebo-controlled studies of the efficacy of epi-gam in the treatment of atopic eczema. Relationship between plasma essential fatty acid changes and clinical response. *The British Journal of Dermatology* 1989;121(1):75-90.

Mueller BA, Talbert RL, Tegeler CH, Prihoda TJ. The bleeding time effects of a single dose of aspirin in subjects receiving omega-3 fatty acid dietary supplementation. *Journal of Clinical Pharmacology* 1991;31(2):185-190.

Murphy MG, Wright V, Ackman RG, Horackova M. Diets enriched in menhaden fish oil, seal oil, or shark liver oil have distinct effects on the lipid and fatty-acid composition of guinea pig heart. *Molecular and Cellular Biochemistry* 1997;177(1-2):257-269.

Murphy MG, Wright V, Scott J, Timmins A, Ackman RG. Dietary menhaden, seal, and corn oils differentially affect lipid and ex vivo eicosanoid and thiobarbituric acid-reactive substances generation in the guinea pig. *Lipids* 1999;34(2):115-124.

Nagakura T, Matsuda S, Shichijyo K, Sugimoto H, Hata K. Dietary supplementation with fish oil rich in ω -3 polyunsaturated fatty acids in children with bronchial asthma. *European Respiratory Journal* 2000;16(5):861-865.

Nakamura K, Kariyazono H, Komokata T, Hamada N, Sakata R, Yamada K. Influence of preoperative administration of ω -3 fatty acid-enriched supplement on inflammatory and immune responses in patients undergoing major surgery for cancer. *Nutrition* 2005;21(6):639-645.

Nelson GJ, Schmidt PS, Bartolini GL, Kelley DS, Kyle D. The effect of dietary docosahexaenoic acid on platelet function, platelet fatty acid composition, and blood coagulation in humans. *Lipids* 1997;32(11):1129-1136.

Nemets B, Osher Y, Belmaker RH. Omega-3 fatty acids and augmentation strategies in treating resistant depression. *Essential Psychopharmacology* 2004;6(1):59-64.

Nemets B, Stahl Z, Belmaker RH. Addition of omega-3 fatty acid to maintenance medication treatment for recurrent unipolar depressive disorder. *American Journal of Psychiatry* 2002;159(3):477-479.

Nettleton JA, Katz R. N-3 long-chain polyunsaturated fatty acids in type 2 diabetes: a review. *Journal of the American Dietetic Association* 2005;105(3):428-440.

Nielsen GL, Faarvang KL, Thomsen BS, Teglbjærg KL, Jensen LT, Hansen TM, Lervang HH, Schmidt EB, Dyerberg J, Ernst E. The effects of dietary supplementation with n-3 polyunsaturated fatty acids in patients with rheumatoid arthritis: a randomized, double blind trial. *European Journal of Clinical Investigation* 1992;22(10):687-691.

Noaghiul S, Hibbeln JR. Review: Cross-national comparisons of seafood consumption and rates of bipolar disorders. *The American Journal of Psychiatry* 2003;160(12):2222-2227.

Nordoy A, Barstad L, Connor WE, Hatcher L. Absorption of the n-3 eicosapentaenoic and docosahexaenoic acids as ethyl esters and triglycerides by humans. *The American Journal of Clinical Nutrition* 1991;53(5):1185-1190.

Nordström DC, Honkanen VE, Nasu Y, Antila E, Friman C, Kontinen YT. Alpha-linolenic acid in the treatment of rheumatoid arthritis. A double-blind, placebo-controlled and randomized study: flaxseed vs. safflower seed. *Rheumatology International* 1995;14(6):231-234.

O'Connor GT, Malenka DJ, Olmstead EM. A meta-analysis of randomized trials of fish oil in prevention of restenosis following coronary angioplasty. *American Journal of Preventive Medicine* 1992;8(3):186-192.

Ockerman P, Bachrack I, Glans S, Rassner S. Evening primrose oil as a treatment of premenstrual syndrome. *Recent Advances in Clinical Nutrition* 1986;2:405-404.

Olafsdottir AS, Magnusardottir AR, Thorgeirdottir H, Hauksson A, Skuladottir GV,

Steingrimsdottir L. Relationship between dietary intake of cod liver oil in early pregnancy and birthweight. *BJOG: An International Journal of Obstetrics and Gynaecology* 2005;112(4):424-429.

Oliwiecki S, Burton J. Evening primrose oil and marine oil in the treatment of psoriasis. *Clinical and Experimental Dermatology* 1994;19(2):127-129.

Oliwiecki S, Armstrong J, Burton J, Bradfield J. The effect of essential fatty acids on epidermal atrophy due to topical steroids. *Clinical and Experimental Dermatology* 1993;18(4):326-328.

Olsen SF, Secher NJ. Low consumption of seafood in early pregnancy as a risk factor for preterm delivery: prospective cohort study. *British Medical Journal* 2002;324(7335):447-450.

Onwude JL, Lilford RJ, Hjartardottir H, Staines A, Tuffnell D. A randomised double blind placebo controlled trial of fish oil in high risk pregnancy. *British Journal of Obstetrics and Gynaecology* 1995;102(2):95-100.

Osher Y, Bersudsky U, Belmaker, RH. Omega-3 eicosapentaenoic acid in bipolar depression: report of a small open-label study. *Journal of Clinical Psychiatry* 2005;66(6):726-729.

Pan Y, Lemyre B. Effects of Omega-3 Fatty Acids on Child and Maternal Health. Summary, Evidence Report/Technology Assessment No. 118. AHRQ No. 05-E025-2. Rockville (MD): Agency for Healthcare Research and Quality;2005.

Parker G G, Gibson NA, Brotchie H, Heruc G, Rees AM, Hadzi-Pavlovic D. Review: omega-3 fatty acids and mood disorders. *American Journal of Psychiatry* 2006; 163(6):969-978.

Pashby NL, Mansel RE, Hughes LE, Hanslip J, Preece PE. A clinical trial of evening primrose oil in mastalgia. *The British Journal of Surgery* 1981;68:801.

Paus T, Zijdenbos A, Worsley K, Collins DL, Blumenthal J, Giedd JN, Rapoport JL, Evans AC. Structural maturation of neural pathways in children and adolescents: in vivo study. *Science* 1999;283(5409):1908-1911.

Pawlosky RJ, Bacher J, Salem N. Ethanol consumption alters electroretinograms and depletes neural tissues of docosahexaenoic acid in rhesus monkeys: nutritional consequences of a low n-3 fatty acid diet. *Alcoholism: Clinical and Experimental Research* 2001;25(12):1758-1765.

Peat JK, Miharshahi S, Kemp AS, Marks GB, Tovey ER, Webb K, Mellis CM, Leeder SR. Three-year outcomes of dietary fatty acid modification and house dust mite reduction in the Childhood Asthma Prevention Study. *Journal of Allergy and Clinical Immunology* 2004;114(4):807-813.

Pedersen HS, Mulvad G, Seidelin KN, Malcom GT, Boudreau DA. N-3 fatty acids as a risk factor for haemorrhagic stroke. *The Lancet* 1999;353(9155):812-813.

Peet M. Eicosapentaenoic acid in the treatment of schizophrenia and depression: rationale and



preliminary double-blind clinical trial results. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2003;69(6):477-485.

Picado C, Castillo JA, Schinca N, Pujades M, Ordinas A, Coronas A, Agusti-Vidal A. Effects of a fish oil enriched diet on aspirin intolerant asthmatic patients: a pilot study. *Thorax* 1988;43(2):93-97.

Puolakka J, Mäkäräinen L, Viinikka L, Ylikorkala O. Biochemical and clinical effects of treating the premenstrual syndrome with prostaglandin synthesis precursors. *The Journal of Reproductive Medicine* 1985;30(3):149-153.

Puri BK. The safety of evening primrose oil in epilepsy. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2007;77:101-103.

Radack K, Deck C, Huster G. The comparative effects of n-3 and n-6 polyunsaturated fatty acids on plasma fibrinogen levels: a controlled clinical trial in hypertriglyceridemic subjects. *Journal of the American College of Nutrition* 1990; 9(4):352-357.

Raitt MH, Connor WE, Morris C, Kron J, Halperin B, Chugh SS, McClelland J, Cook J, MacMurdy K, Swenson R, Connor SL, Gerhard G, Kraemer DF, Oseran D, Marchant C, Calhoun D, Shnider R, McAnulty J. Fish oil supplementation and risk of ventricular tachycardia and ventricular fibrillation in patients with implantable defibrillators: a randomized controlled trial. *JAMA: The Journal of the American Medical Association* 2005;293(23):2884-2891.

Reddy BS. Omega-3 fatty acids in colorectal cancer prevention. *International Journal of Cancer* 2004;112(1):1-7.

Reis GJ, Silverman DI, Boucher TM, Sipperly ME, Horowitz GL, Sacks FM, Pasternak RC. Effects of two types of fish oil supplements on serum lipids and plasma phospholipids fatty acids in coronary artery disease. *The American Journal of Cardiology* 1990;15(66):1171-1175.

Richardson AJ. Clinical trials of fatty acid treatment in ADHD, dyslexia, dyspraxia and the autistic spectrum. *Prostaglandins, Leukotrienes, and Essential Fatty Acids* 2004;70(4):383-390.

Richardson AJ, Montgomery P. The Oxford-Durham study: a randomized, controlled trial of dietary supplementation with fatty acids in children with developmental coordination disorder. *Pediatrics* 2005;115(5):1360-1366.

Richardson AJ, Puri BK. A randomized double-blind, placebo-controlled study of the effects of supplementation with highly unsaturated fatty acids on ADHD-related symptoms in children with specific learning difficulties. *Progress in Neuropsychopharmacology and Biological Psychiatry* 2002;26(2):233-239.

Richardson AJ, Puri BK. The potential role of fatty acids in attention-deficit/hyperactivity disorder. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2000;63(1-2):79-87.

Rose DP, Connolly JM. Omega-3 fatty acids as cancer chemopreventive agents. *Pharmacology*

& Therapeutics 1999;83(3):217-244.

Rosenstein ED, Kushner LJ, Kramer N, Kazandjian G. Pilot study of dietary fatty acid supplementation in the treatment of adult periodontitis. Prostaglandins, Leukotrienes, and Essential Fatty Acids 2003;68(3):213-218.

Sagduyu K, Docucu ME, Eddy BA, Craigen G, Baldassano CF, Yildiz A. Omega-3 fatty acids decreased irritability of patients with bipolar disorder in an add-on, open label study. Nutrition Journal 2005;4:6.

Sagredos AN. [Fatty Acid Composition of Fish Oil Capsules]. Fett Wissenschaft Technologie 1991;93(5):184-191 [article in German].

Samieri C, Feart C, Letenneur L, Dartigues JF, Peres K, Auriacombe S, Peuchant E, Delcourt C, Barberger-Gateau P. Low plasma eicosapentaenoic acid and depressive symptomatology are independent predictors of dementia risk. The American Journal of Clinical Nutrition 2008;88(3):714-721.

Sanders TA, Hinds A. The influence of a fish oil high in docosahexaenoic acid on plasma lipoprotein and vitamin E concentrations and haemostatic function in healthy male volunteers. The British Journal of Nutrition 1992;68(1):163-173.

Sanders TA, Lewis F, Slaughter S, Griffin BA, Griffin M, Davies I, Millward DJ, Cooper JA, Miller GJ. Effect of varying the ratio of n-6 to n-3 fatty acids by increasing the dietary intake of alpha-linolenic acid, eicosapentaenoic and docosahexaenoic acid or both on fibrinogen and clotting factors VII and XII in persons aged 45-70 y: the OPTILIP Study. The American Journal of Clinical Nutrition 2006;84(3):513-522.

Saynor R, Gillott T. Changes in blood lipids and fibrinogen with a note on safety in a long term study on the effects of n-3 fatty acids in subjects receiving fish oil supplements and followed for seven years. Lipids 1992;27(7):533-538.

Schachter HM, Kourad K, Merali Z, Lumb A, Tran K, Miguelez M, Lewin G, Sampson M, Barrowman N, Senechal H, McGahern C, Zhang L, Morrison A, Shlik J, Pan Y, Lowcock EC, Gaboury I, Bradwejn J, Duffy A. Effects of Omega-3 Fatty Acids on Mental Health. Summary, Evidence Report/Technology Assessment No. 116. AHRQ No. 05-E022-2. Rockville (MD): Agency for Healthcare Research and Quality; 2005.

Schäfer L, Kragballe K. Supplementation with evening primrose oil in atopic dermatitis: effect on fatty acids in neutrophils and epidermis. Lipids 1991;26(7):557-560.

Schalin-Karrila M, Mattila L, Jansen CT, Uotila P. Evening primrose oil in the treatment of atopic eczema: effect on clinical status, plasma phospholipid fatty acids and circulating blood prostaglandins. The British Journal of Dermatology 1987;117(1):11-19.

Schmidt EB, Lervang HH, Varming K, Madsen P, Dyerberg J. Long-term supplementation with

n-3 fatty acids, I: effect on blood lipids, haemostasis and blood pressure. *Scandinavian Journal of Clinical and Laboratory Investigation* 1992;52(3):221-228.

Schubert R, Kitz R, Beermann C, Rose MA, Baer PC, Zielen S, Boehles H. Influence of low-dose polyunsaturated fatty acids supplementation on the inflammatory response of healthy adults. *Nutrition* 2007;23(10):724-730.

Scientific Advisory Committee on Nutrition, Foods Standard Agency, Department of Health. *Advice on Fish Consumption: Benefits and Risks*. London (GB): TSO (The Stationery Office); 2004. [Accessed 2023 March 07]. Available from: <https://cot.food.gov.uk/sites/default/files/cot/fishreport200401.pdf>.

Sharpe GR, Farr PM. Evening primrose oil and eczema. *The Lancet* 335(8690):667-668.

Shuster J. 1996. Black cohosh root? Chasteberry tree? Seizures! *Hospital Pharmacy* 1990;31(12):1553-1554.

Silverman DI, Ware JA, Sacks FM, Pasternak RC. Comparison of the absorption and effect of on platelet function of a single dose of n-3 fatty acids given as fish or fish oil. *The American Journal of Clinical Nutrition* 1991;53(5):1165-1170.

Silvers KM, Woolley CC, Hamilton FC, Watts PM, Watson RA. Randomised double-blind placebo-controlled trial of fish oil in the treatment of depression. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2005;72(3):211-218.

Simmer K, Schulzke SM, Patole S. Longchain polyunsaturated fatty acid supplementation in preterm infants. *Cochrane Database of Systematic Reviews Issue 1 Art. No.:CD000375*. DOI: 10.1002/14651858.CD000375pub3; 2008.

Simons LA, Parfitt A, Simons J, Balasubramaniam S. Effects of an ethyl ester preparation of fish oils (Himega) on lipids and lipoproteins in hyperlipidaemia. *Australian and New Zealand Journal of Medicine* 1990;20(5):689-694.

Simopoulos AP, Leaf A, Salem N. Workshop on the essentiality of and recommended dietary intakes for omega-6 and omega-3 fatty acids. *Journal of the American College of Nutrition* 1999;18(5):487-489.

Singh M. Essential fatty acids, DHA and human brain. *Indian Journal of Pediatrics* 2005;72(3):239-242.

Sinn N, Bryan J. Effect of supplementation with polyunsaturated fatty acids and micronutrients on learning and behavior problems associated with child ADHD. *Journal of Development and Behavioural Pediatrics* 2007;28(2):82-91.

Solfrizzi V, Colacicco AM, D'Introno A, Capurso C, Del Parigi A, Capurso SA, Argentieri G, Capurso A, Panza F. Dietary fatty acids intakes and rate of mild cognitive impairment. *The*

Italian Longitudinal Study on Aging. *Experimental Gerontology* 2006;41(6):619-627.

Stehr SN, Heller AR. Omega-3 fatty acid effects on biochemical indices following cancer surgery. *Clinica Chimica Acta* 2006; 373(1-2):1-8.

Stevens LJ, Zentall SS, Deck JL, Abate ML, Watkins BA, Lipp SR, Burgess JR. Essential fatty acid metabolism in boys with attention-deficit hyperactivity disorder. *The American Journal of Clinical Nutrition* 1995;62(4):761-768.

Stevens LJ, Zentall SS, Abate ML, Kuczek T, Burgess JR. Omega-3 fatty acids in boys with behavior, learning and health problems. *Physiology and Behaviour* 1996;59(4-5):915-920.

Stevens L, Zhang W, Peck L, Kuczek T, Grevstad N, Mahon A, Zentall SS, Arnold LE, Burgess JR. EFA supplementation in children with inattention, hyperactivity, and other disruptive behaviors. *Lipids* 2003;38(10):1007-1021.

Stoll AL, Severus WE, Freeman MP, Rueter S, Zboyan HA, Diamond E, Cress KK, Marangell LB. Omega 3 fatty acids in bipolar disorder: a preliminary double-blind, placebo-controlled trial. *Archives of General Psychiatry* 1999;56(5):407-412.

Stone KJ, Willis AL, Hart WM, Kirtland SJ, Kernoff PB, McNicol GP. The metabolism of dihomo- γ -linolenic acid in man. *Lipids* 1979;14(2):174-180.

Studer M, Briel M, Leimenstoll B, Glass TR, Bucher HC. Effect of different antilipidemic agents and diets on mortality: a systematic review. *Archives of Internal Medicine* 2005;165(7):725-730.

Su KP, Huang S, Chiu C, Shen WW. Omega-3 fatty acids in major depressive disorder. A preliminary double-blind, placebo-controlled trial. *European Neuropsychopharmacology* 2003;13(4):267-271.

Sundrarjun T, Komindr S, Archararit N, Dahlan W, Puchaiwatananon O, Angtharak S, Udomsuppayakul U, Chuncharunee S. Effects of n-3 fatty acids on serum interleukin-6, tumour necrosis factor- α , and soluble tumour necrosis factor receptor p55 in active rheumatoid arthritis. *The Journal of International Medical Research* 2004;32(5):443-454.

Svensson M, Schmidt EB, Jørgensen KA, Christensen JH. N-3 fatty acids as secondary prevention against cardiovascular events in patients who undergo chronic hemodialysis: a randomized, placebo-controlled intervention trial. *Clinical Journal of the American Society of Nephrology* 2006;1(4):780-786.

Szajewska H, Horvath A, Koletzko B. Effect of n-3 long-chain polyunsaturated fatty acid supplementation of women with low-risk pregnancies on pregnancy outcomes and growth measures at birth: a meta-analysis of randomized controlled trials. *The American Journal of Clinical Nutrition* 2006;83(6):1337-1344.

Takemura Y, Sakurai Y, Honjo S, Tokimatsu A, Gibo M, Hara T, Kusakari A, Kugai N. The

relationship between fish intake and the prevalence of asthma: the Tokorozawa Childhood Asthma and Pollinosis Study. *Preventive Medicine* 2002;34(2):221-225.

Takezaki T, Inoue M, Kataoka H, Ikeda S, Yoshida M, Ohashi Y, Tajima K, Tominaga S. Diet and lung cancer risk from a 14-year population-based prospective study in Japan: with special reference to fish consumption. *Nutrition and Cancer* 2003;45(2):160-167.

Takwale A, Tan E, Agarwal S, Barclay G, Ahmed I, Hotchkiss K, Thompson JR, Chapman T, Berth-Jones J. Efficacy and tolerability of borage oil in adults and children with atopic eczema: randomised, double blind, placebo controlled, parallel group trial. *British Medical Journal* 2003;327(7428):1385.

Tanskanen A, Hibbeln JR, Tuomilehto J, Uutela A, Haukkala A, Viinamaki H, Lehtonen J, Vartiainen E. Fish consumption and depressive symptoms in the general population in Finland. *Psychiatric Services* 2001;52(4):529-531.

Terry PD, Terry JB, Rohan TE. Long-chain (n-3) fatty acid intake and risks of cancers of the breast and the prostate: recent epidemiological studies, biological mechanisms, and directions for future research. *The Journal of Nutrition* 2004;134(Suppl 12):3412S-3420S.

Theobald HE, Goodall AH, Sattar N, Talbot DC, Chowienczyk PJ, Sanders TA. Low-dose docosahexaenoic acid lowers diastolic blood pressure in middle-aged men and women. *The Journal of Nutrition* 2007;137(4):973-978.

Theodoratou E, McNeill G, Cetnarskyj R, Farrington SM, Tenesa A, Barnetson R, Porteous M, Dunlop M, Campbell H. Dietary fatty acids and colorectal cancer: a case-control study. *American Journal of Epidemiology* 2007;166(2):181-195.

Thies F, Nebe-von-Caron G, Powell JR, Yaqoob P, Newsholme EA, Calder PC. Dietary supplementation with eicosapentaenoic acid, but not with other long-chain n-3 or n-6 polyunsaturated fatty acids, decreases natural killer cell activity in healthy subjects aged >55 y. *The American Journal of Clinical Nutrition* 2001;73(3):539-548.

Tsekos E, Reuter C, Stehle P, Boeden G. Perioperative administration of parenteral fish oil supplements in a routine clinical setting improves patient outcome after major abdominal surgery. *Clinical Nutrition* 2004;23(3):325-330.

Tulleken JE, Limburg PC, Muskiet FA, van Rijswijk MH. Vitamin E status during dietary fish oil supplementation in rheumatoid arthritis. *Arthritis and Rheumatism* 1990;33(9):1416-1419.

Tulleken JE, Limburg PC, van Rijswijk MH. Fish oil and plasma fibrinogen. *British Medical Journal* 1988;297(6648):615-616.

Turchini GM, NG WK, Tocher DR, editors. *Fish oil replacement and alternative lipid sources in aquaculture feeds*. Boca Raton (FL): Taylor and Francis Group; 2011

Uauy R, Hoffmann DR, Mena P, Llanos A, Birch EE. Term infant studies of DHA and ARA supplementation on neurodevelopment: results of randomized controlled trials. *Journal of Pediatrics* 2003;143(Suppl 4):S17-S25.

Vaddadi KS. The use of gamma-linolenic acid and linoleic acid to differentiate between temporal lobe epilepsy and schizophrenia. *Prostaglandins and Medicine* 1981;6(4):375-379.

Vaisman N, Kaysar N, Zaruk-Adasha Y, Pelled D, Brichon G, Zwingelstein G, Bodennec J. Correlation between changes in blood fatty acid composition and visual sustained attention performance in children with inattention: effect of dietary n-3 fatty acids containing phospholipids. *The American Journal of Clinical Nutrition* 2008;87(5):1170-1180.

Valagussa F, Franzosi MG, Geraci E, Mininni N, Nicolosi GL, Santini M, Tavazzi L, Vecchio C. Dietary supplementation with n-3 polyunsaturated fatty acids and vitamin E after myocardial infarction: results of the GISSI-Prevenzione trial. *The Lancet* 1999;354(9177):447-455.

Valk EE, Hornstra G. Relationship between vitamin E requirement and polyunsaturated fatty acid intake in man: a review. *International Journal for Vitamin and Nutrition Research* 2000;70(2):31-42.

van de Rest O, Geleijnse JM, Kok FJ, van Staveren WA, Hoefnagels WH, Beekman AT, de Groot LC. Effect of fish-oil supplementation on mental well-being in older subjects: a randomized, double-blind, placebo-controlled trial. *The American Journal of Clinical Nutrition* 2008;88(3):706-713.

Van der Tempel H, Tulleken JE, Limburg PC, Muskiet FA, van Rijswijk MH. Effects of fish oil supplementation in rheumatoid arthritis. *Annals of the Rheumatic Diseases* 1990;49(2):76-80.

van Gelder BM, Tijhuis M, Kalmijn S, Kromhout D. Fish consumption, n-3 fatty acids, and subsequent 5-y cognitive decline in elderly men: the Zutphen Elderly Study. *The American Journal of Clinical Nutrition* 2007;85(4):1142-1147.

van Gool CJ, Zeegers MP, Thijs C. Oral essential fatty acid supplementation in atopic dermatitis – a meta-analysis of placebo-controlled trials. *The British Journal of Dermatology* 2004;150(4):728-740.

Veale D, Torley HI, Richards IM, O'Dowd A, Fitzsimons C, Belch JJ, Sturrock RD. A double-blind placebo controlled trial of Efamol® Marine on skin and joint symptoms of psoriatic arthritis. *British Journal of Rheumatology* 1994;33(10):954-958.

Velho S, Marques-Vidal P, Baptista F, Camilo ME. Dietary intake adequacy and cognitive function in free-living active elderly: a cross-sectional and short-term prospective study. *Clinical Nutrition* 2008;27(1):77-86.

Velzing-Aarts FV, van der Klis FR, van der Dijs FP, van Beusekom CM, Landman H, Capello JJ, Muskiet FA. Effect of three low-dose fish oil supplements, administered during pregnancy,

on neonatal long-chain polyunsaturated fatty acid status at birth. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2001;65(1):51-57.

Vericel E, Lagarde M, Mendy F, Courpron PH, Dechavanne M. Effects of gamma-linolenic acid intake on platelet functions in elderly people. *Thrombosis Research* 1986;42(4):499-509.

Vidgren HM, Ågren JJ, Schwab U, Rissanen T, Hänninen O, Uusitupa MI. Incorporation of n-3 fatty acids into plasma lipid fractions, and erythrocyte membranes and platelets during dietary supplementation with fish, fish oil, and docosahexaenoic acid-rich oil among healthy young men. *Lipids* 1997;32(7):697-705.

Visioli F, Risé P, Barassi MC, Marangoni F, Galli C. Dietary intake of fish vs. formulations leads to higher plasma concentrations of n-3 fatty acids. *Lipids* 2003;38(4):415-418.

Vlaandingerbroek H, Hornstra G, de Koning TJ, Smeitink JA, Bakker HD, de Klerk HBC, Rubio-Gozalbo ME. Essential polyunsaturated fatty acids in plasma and erythrocytes of children with inborn errors of amino acid metabolism. *Molecular genetics and metabolism* 2006;88(2):159-165.

Voigt RG, Llorente AM, Jensen CL, Fraley JK, Berretta MC, Heird WC. A randomized, double-blind, placebo-controlled trial of docosahexaenoic acid supplementation in children with attention-deficit/hyperactivity disorder. *The Journal of Pediatrics* 2001;139(2):189-196.

von Schacky C, Fischer S, Weber PC. Long-term effects of dietary marine ω -3 fatty acids upon plasma and cellular lipids, platelet function, and eicosanoid formation in humans. *The Journal of Clinical Investigation* 1985;76(4):1626-1631.

von Schacky C, Weber PC. Metabolism and effects on platelet function of the purified eicosapentaenoic and docosahexaenoic acids in humans. *The Journal of Clinical Investigation* 1985;76(6):2446-2450.

Walker T, Singh PK, Wyatt KM, O'Brien PM. The effect of prostanoid precursors and inhibitors on platelet angiotensin II binding. *Journal of Obstetrics and Gynaecology* 1999;19(1):56-58.

Wang W, Shinto L, Connor WE, Quinn JF. Nutritional biomarkers in Alzheimer's disease: the association between carotenoids, n-3 fatty acids, and dementia severity. *Journal of Alzheimer's Disease* 2008;13(1):31-38.

Westenhoefer J, Bellisle F, Blundell JE, de Vries J, Edwards D, Kallus W, Milon H, Pannemans D, Tuijtelaars S, Tuorila H. PASSCLAIM – mental state and performance. *European Journal of Nutrition* 2004;43(Suppl 2):ii85-ii117.

Wetzig N. Mastalgia: a 3 year Australian study. *The Australian and New Zealand Journal of Surgery* 1994;64(5):321-329.

Whalley LJ, Fox HC, Wahle KW, Starr JM, Deary IJ. Cognitive aging, childhood intelligence,

and the use of food supplements: possible involvement of n-3 fatty acids. *The American Journal of Clinical Nutrition* 2004;80(6):1650-1657.

Whelton SP, He J, Whelton PK, Muntner P. Meta-analysis of observational studies of fish intake and coronary heart disease. *The American Journal of Cardiology* 2004; 93(9):1119-1123.

Whitaker D, Cilliers J, de Beer C. Evening primrose (Epogam®) in the treatment of chronic hand dermatitis: disappointing therapeutic results. *Dermatology* 1996.;193(2):115-120.

Wiersema J, León B. *World Economic Plants: A Standard Reference*. Boca Raton (FL): CRC Press LLC.; 1999.

Williamson EM, Evans FJ, Wren RC. *Potter's New Cyclopaedia of Botanical Drugs and Preparations*. Saffron Walden (GB): C.W. Daniel Company Limited; 1988.

Wohl DA, Tien HC, Busby M, Cunningham C, Macintosh B, Napravnik S, Danan E, Donovan K, Hossenipour M, Simpson RJ Jr. Randomized study of the safety and efficacy of fish oil (omega-3 fatty acid) supplementation with dietary and exercise counselling for the treatment of antiretroviral therapy-associated hypertriglyceridemia. *Clinical Infectious Diseases* 2005; 41(10):1498-1504.

Wong KW. Clinical efficacy of n-3 fatty acid supplementation in patients with asthma. *Journal of the American Dietetic Association* 2005;105(1):98-105.

Woodman RJ, Mori TA, Burke V, Puddey IB, Barden A, Watts GF, Beilin LJ. Effects of purified eicosapentaenoic acid and docosahexaenoic acid on platelet, fibrinolytic and vascular function in hypertensive type 2 diabetic patients. *Atherosclerosis* 2003;166(1):85-93.

Woodman RJ, Mori TA, Burke V, Puddey IB, Watts GF, Beilin LJ. Effects of purified eicosapentaenoic and docosahexaenoic acids on glycemic control, blood pressure, and serum lipids in type 2 diabetic patients with treated hypertension. *The American Journal of Clinical Nutrition* 2002;76(5):1007-1015.

Wright S, Burton JL. Oral evening primrose seed oil improves atopic eczema. *The Lancet* 1982;(8308):1120-1122.

Yehuda S, Rabinovich S, Mostofsky DI. Modulation of learning and neuronal membrane composition in the rat by essential fatty acid preparation: time-course analysis. *Neurochemical Research* 1998; 23(5):627-634.

Yoon S, Lee J, Lee S. The therapeutic effect of evening primrose oil in atopic dermatitis patients with dry scaly skin lesions is associated with the normalization of serum gamma-interferon levels. *Skin Pharmacology and Applied Skin Physiology* 2002;15(1):20-25.

Yoshimoto-Furuie K, Yoshimoto K, Tanaka T, Saima S, Kikuchi Y, Shay J, Horrobin DF, Echizen H. Effects of oral supplementation with evening primrose oil for six weeks on plasma

essential fatty acid and uremic skin symptoms in hemodialysis patients. *Nephron* 1999;81(2):151-159.

Yzebe D, Lievre M. Fish oils in the care of coronary heart disease patients: a meta-analysis of randomized controlled trials. *Fundamental & Clinical Pharmacology* 2004;18(5):581-592.

Appendix 1.

Density of the fixed oils

Fixed oils	Parts	Density
Borage oil	Seed	0.908 – 0.925 g/mL
False flax oil	Seed	0.918 – 0.927 g/mL
Hemp seed oil	Seed	0.920 – 0.930 g/mL
Canola oil	Seed	0.917 – 0.923 g/mL*
Safflower oil	Seed	0.918 – 0.937 g/mL
Coconut oil	Seed endosperm	0.913 – 0.919 g/mL
Cod liver oil	Liver	0.921 – 0.927 g/mL
Pumpkin seed oil	Seed	0.901 – 0.924 g/mL
Fish oil	Whole	0.929 – 0.931 g/mL
Sunflower oil	Seed	0.919 – 0.920 g/mL
Sea buckthorn fruit oil	Fruit	0.913 – 0.919 g/mL
Sea buckthorn seed oil	Seed	0.913 – 0.919 g/mL
Krill oil	Whole	0.919 – 0.925 g/mL*
Flaxseed oil	Seed	0.928 – 0.935 g/mL
Evening Primrose oil	Seed	0.918 – 0.930 g/mL
Olive oil	Fruit	0.908 – 0.914 g/mL
Sweet Almond oil	Seed	0.913 – 0.919 g/mL*
Blackcurrant seed oil	Seed	0.919 – 0.926 g/mL
Chia seed oil	Seed	0.922 – 0.927 g/mL
Schizochytrium oil (algal oil)	Whole	0.944 – 0.950 g/mL
Seal oil	Blubber	0.921 – 0.927 g/mL*
Squid oil	Whole	0.953 – 0.959 g/mL*
Wheat germ oil	Seed germ	0.922 – 0.937 g/mL
Grape Seed oil	Seed	0.921 – 0.924 g/mL

*When only a single value was found in the evidence, a variation of +/- 0.003 g/mL was applied to allow for potential variability.

At least one of the following references was used to support density ranges: Moovendhan 2021; Turck et al. 2021; Purnamayati et al. 2019; Uzunova et al. 2019; Delgado-et al. 2018; Petcu et al. 2016; Lee et al. 2014; Edwin et al. 2013; Firestone 2013; Manisha and Sharma 2011; Zhang et al. 2011; Alamu et al. 2010; Budavari 1996; Subrahmanyam et al. 1994; Kyte R.M. 1956.