

Omega-3 Fatty Acids (EPA and DHA) from Fish/Marine Oils

What Fish Oil Is:

EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) are the two principal fatty acids found in fish. They belong to a family of essential nutrients known as omega-3 fatty acids. DHA can also be obtained from other marine sources, such as algae (algal oil). EPA and DHA are polyunsaturated fats ("good" fats, as opposed to saturated fats which are thought to increase the risk of heart disease). The human body can manufacture both EPA and DHA from another essential fatty acid, alpha-linolenic acid (ALA) — found in flaxseed oil, canola oil, soy oil, walnut oil, chia oil, and green leafy vegetables — but only to a limited extent. Dogs and cats do not make this conversion well at all, and must take fish oil to get the beneficial effects of EPA and DHA. ALA is often found in fish oil and fatty acid supplements for pets. It is not at all harmful, but is not as beneficial as EPA and DHA.

What Fish Oil Does:

Cardiovascular Disease: Omega-3 fatty acids have been most widely studied regarding their effects on cardiovascular health. Omega-3 fatty acids have a number of heart-healthy effects, including reducing triglyceride levels, raising levels of HDL ("good") cholesterol and, possibly, "thinning" the blood, reducing levels of homocysteine and reducing blood pressure. Fish oils also appear to enhance the effectiveness of statin drugs used to improve cholesterol profile. The U.S. Food and Drug Administration (FDA) permits supplements containing omega-3 fatty acids to state: "The scientific evidence about whether omega-3 fatty acids may reduce the risk of coronary heart disease is suggestive, but not conclusive." A similar claim was approved in September 2004 for foods containing fish oils, such as salmon.

Arthritis and Other Inflammatory Diseases: Increased intake of the omega-3 fatty acids in fish oil alter the body's production of substances known as prostaglandins, and, consequently, reduce some forms of inflammation. On the basis of this, EPA and DHA have been tried in the treatment of symptoms of rheumatoid arthritis with considerable success (especially in early stages of the disease). Unlike "disease modifying" drugs, however, fish oil probably doesn't slow the progression of the disease. It just moderates the symptoms. The anti-inflammatory effects of EPA and DHA have also caused researchers to investigate possible benefits of fish oil for the treatment of inflammatory bowel disease, lupus, and allergies. For each of these conditions, at least one double-blind study has found positive results.

Kidney Disease: Fish oil has been shown in several studies to slow progression of chronic kidney disease, particularly glomerular disease, where the kidneys lose protein.

Cancer: Diets high in fish oil have been shown to significantly lengthen survival in dogs with lymphoma.

Psychiatric and Mental Disorders: For reasons that are less clear, omega-3s seem to help depression, bipolar disorder, and schizophrenia, according to a limited number of double-blind trials. Fish oil has also been proposed for attention deficit disorder, borderline personality disorder, dyslexia and cognitive impairment, but as yet the supporting evidence for these uses remains exceedingly preliminary. We do not know yet how these effects will apply to animals. Fish oil is sometimes recommended for pets with injuries to the brain and spinal cord, or senility.

Pregnancy and Nursing: DHA is important for normal development and functioning of the brain and retina in the fetus and in infants. For this reason, it is thought that pregnant or nursing mothers may benefit from supplementation. DHA is also often added to formula for premature infants and some regular infant formulas and foods. Omega-3's may also reduce the risk of premature delivery in pregnant women.

Quality Concerns:

Because omega-3 fatty acids are obtained from natural sources, levels in supplements can vary, depending on the source and method of processing. Contamination has also been an issue, because fish

can accumulate toxins such as mercury, dioxins, and PCBs. Mercury can damage the nervous system — particularly in a fetus. Dioxins and polychlorinated biphenyls (PCBs) may be carcinogens at low levels of exposure over time and may have other deleterious effects. The freshness of the oil is also an important consideration because rancid fish oils have an extremely unpleasant odor and may not be as effective. Neither the FDA nor any other federal or state agency routinely tests fish or marine oil supplements for quality prior to sale.

Omega-3 vs. Omega-6 Fatty Acids:

Some experts suggest that the American diet (people AND pets) contains too little omega-3 fatty acids and too much of another essential fatty acid family called the omega-6 fatty acids. While omega-3 fatty acids such as EPA and DHA have powerful anti-inflammatory properties, omega-6 fatty acids can actually cause inflammation. So the more omega-6 fatty acids that are eaten in food, the more omega-3 fatty acids are needed to overcome the inflammation they cause. Corn is a food that is very high in omega-6 fatty acids, and is also a common ingredient in commercial dog foods. Many times fish oil supplements have omega-6 fatty acids added to them, largely because they are inexpensive fillers. Fish oil products with omega-6 fatty acids in them should be avoided, because it is difficult to tell how much fish oil should be taken to overcome their pro-inflammatory effects. The typical ratio of omega-6's to omega-3's in the American diet is believed to be as high as 20:1 (20 grams of omega 6's for every gram of omega-3's). Experts suggest that a ratio somewhere between 3:1 and 9:1 (3-9 grams of omega-6's for every 1 gram of omega-3) may be preferable. Unfortunately, many commercial dog foods are as high as 50:1. See the chart at the end of this handout for ratios of common commercial diets.

Omega-6 fatty acids to avoid include in pets with inflammation (allergies, arthritis, immune mediated disease, glomerular disease, etc):

- **Linoleic acid** – in sunflower oil, peanut oil, flax oil, olive oil, cottonseed oil, soybean oil, corn oil
- **Gamma-linolenic acid (GLA)** – in flax oil, evening primrose oil, borage oil, black currant oil
- **Arachidonic acid** – not found in plants, but found in some animal products

We must clarify that omega-6 fatty acids are not all bad. There are some non-inflammatory skin conditions, like seborrhea (oily, smelly, and sometimes flaky skin), which can respond nicely to omega-6 fatty acids.

Things to Consider When Giving Fish Oil to Your Pet:

Fish oil supplements are generally considered safe, but there are a few caveats and cautions you should take into consideration before you buy:

- The most common side effects are fishy smelling burps and diarrhea. Fish oils are best tolerated when taken with meals, and should be taken in divided doses, i.e., divide the dose in half and take twice daily.
- Be aware that cod liver oil is not always good substitute for fish oil supplements as it is high in vitamins A and D. Because these vitamins can be toxic, make sure that you are not exceeding safe levels for your pet.
- The only significant safety concerns regarding fish oil involve its apparent "blood thinning" effect if taken excessively. On this basis, fish oil should be given to your pet only under a veterinarian's care if your pet has a bleeding disorder such as hemophilia or von Willebrand's Disease, or if they are on blood thinners such as coumadin, warfarin or heparin. Fish oil supplements should probably be stopped 2-3 days prior to surgery, and then resumed 2-3 days after surgery.
- Contrary to earlier reports, fish oil does not appear to adversely affect blood sugar levels in pets with diabetes.
- Because gelcaps are sealed to prevent rancidity, we prefer gelcaps to liquid fish oil supplements.

- Mg of fish oil on the front of the label may not equal the actual mg of EPA and DHA in each gelcap, as other oils may be included in the total amount. Fish oil is given to dog and cats based on amount of EPA and DHA, not the other oils. ALA is an omega-3, but it doesn't count in the dose. Too many omega-6's (LA, GLA, arachidonic acid, many vegetable oils) are counter-productive.
- Suggested doses in the charts seen previously are only starting points. If your dog's weight falls "between gelcap numbers" on the chart just go up to the larger dose. In other words, it is better to give a little too much fish oil than not quite enough. **In general, we give one "regular strength" (250-300 mg EPA + DHA) gelcap per 10 pounds body weight per day, or one "extra strength" (500-600 mg EPA + DHA) gelcap per 20 pounds body weight per day. As mentioned before, you can divide these up into 2 doses during the day. Higher doses may be needed in dogs who eat more omega-6 fatty acids in their diets.**

Recommended Fish Oil Products For Pets with inflammatory Disease	EPA and DHA Per Softgel	OVERALL RESULTS:
Low-Dose Products (less than 250 mg total EPA + DHA)	For cats and small dogs	
Metagenics® EPA-DHA 6:1 TG™ 500mg Concentrated EPA, Optimal Absorption	EPA 50 + DHA 60-100 = 110-150 mg 1 cap daily for a 3.5-5 lb. pet 2 caps daily for a 7-10 lb. pet 3 caps daily for a 11-13 lb. pet	APPROVED
Cardinova PhytoPharmica® ESKIMO-3® Naturally Stable Fish Oil®	EPA 70 + DHA 42 = 112 mg 1 cap daily for a 3.5-5 lb. pet 2 caps daily for a 7-10 lb. pet 3 caps daily for a 11-13 lb. pet	APPROVED
Nature's Bounty® Cold Water Salmon Oil 1000mg	EPA 80 + DHA 120 = 200 mg 1 cap daily for a 6-8 lb. pet 2 caps daily for a 13-16 lb. pet 3 caps daily for a 20-24 lb. pet	APPROVED
Regular Strength Products (250-400 mg total EPA + DHA)	For medium sized dogs	
BJWC Berkley & Jensen™ Fish Oil Concentrate 1000mg with Omega-3 Fatty Acids Costco Kirkland Signature™ Natural Fish Oil Concentrate 1000mg with Omega-3 Fatty Acids	EPA 150 + DHA 100 = 250 mg 1 cap daily for a 8-10 lb dog 2 caps daily for a 16-20 lb dog 3 caps daily for a 25-30 lb dog	APPROVED APPROVED
Pharmavite OLAY™ Vitamins essential balanced omega 3/6™, Enteric Coated for Better Digestion*	EPA 94 + DHA 187 = 281 mg 1 cap daily for a 9-11 lb. dog 2 caps daily for a 18-22 lb. dog 3 caps daily for a 28-34 lb. dog	APPROVED
Albertson's Sav-on Osco by Albertson's™ Natural Fish Oil Concentrate 1000mg with Omega-3 Fatty Acids CVS® pharmacy Natural Fish Oil Concentrate 1000 mg* Natrol Omega-3 Purified Fish Oil Nature's Bounty® Natural Fish Oil 1000mg Cholesterol Free Puritan's Pride® Cholesterol Free Natural Fish Oil EPA 1000mg Rexall Sundown® Fish Oil 1000mg Swanson EPAs Superior Essential Fatty Acids ecOmega™ EPA/DHA Target Origin® Natural Fish Oil Concentrate 1000mg Vitamin World® Naturally Inspired™ Omega-3 Fish Oil 1000mg Cholesterol-Free Whole Foods™ Molecularly Distilled Fish Oil (Concentrated Omega-3 EFAs) 1000 mg	EPA 180 + DHA 120 = 300 mg 1 cap daily for a 10-12 lb. dog 2 caps daily for a 20-24 lb. dog 3 caps daily for a 30-36 lb. dog	APPROVED APPROVED APPROVED APPROVED APPROVED APPROVED APPROVED APPROVED APPROVED
Nature's Bounty Spring Valley Fish Oil 1200 mg Puritan's Pride® Cholesterol Free Fish Oil 1200mg Vitamin World® Cholesterol Free Fish Oil 1200mg	EPA 216 + DHA 144 = 360 mg 1 cap daily for a 12-14 lb. dog 2 caps daily for a 24-29 lb. dog 3 caps daily for a 36-43 lb. dog	APPROVED APPROVED APPROVED
Twin Lab Omega 3 Fish Oil	EPA 234 + DHA 156 = 390 mg 1 cap daily for a 13-15 lb. dog 2 caps daily for a 25-31 lb dog 3 caps daily for a 38-46 lb dog	NOT TESTED
OmegaBrite™ 100% Natural Advanced Omega 3 Formula, 500 mg*	EPA 375 + DHA 55 = 430 mg 1 cap daily for a 14-17 lb. dog 2 caps daily for a 28-34 lb. dog 3 caps daily for a 43-51 lb. dog 4 caps daily for a 57-69 lb. dog 5 caps daily for a 72-86 lb. dog	APPROVED

Recommended Fish Oil Products For Pets with inflammatory Disease	EPA and DHA Per Softgel	OVERALL RESULTS:
Extra Strength Products (400-600 mg total EPA + DHA)	For large dogs	
Advocare® OMEGAPLEX® Omega-3 Fatty Acid Carlson® Super Omega-3 Fish Oils 1000mg Inverness Medical Triomega® Omega-3 Vitamin World® Naturally Inspired™ Super EPA Natural Fish Oil 1000mg Cholesterol-Free	EPA 300 + DHA 200 = 500 mg EPA 333 + DHA 167 = 500 mg 1 cap daily for a 16-20 lb. dog 2 caps daily for a 33-40 lb. dog 3 caps daily for a 50-60 lb. dog 4 caps daily for a 66-80 lb. dog 5 caps daily for a 83-100 lb. dog	APPROVED APPROVED APPROVED APPROVED
Nordic Naturals Ultimate™ Omega, lemon taste	EPA 325 + DHA 225 = 550 mg 1 cap daily for a 18-22 lb. dog 2 caps daily for a 36-44 lb. dog 3 caps daily for a 55-66 lb. dog 4 caps daily for a 73-88 lb. dog 5 caps daily for a 92-110 lb. dog	APPROVED
Allergy Research Group® Super EPA Fish Oil Concentrate DermaPet Eicosaderm (liquid – 1 pump equals 1 gelcap) DermCare® Veterinary Formulas Dietary Supplement Capsules with Omega-3 (Large Breeds) For Dogs	EPA 360 + DHA 240 = 600 mg 1 cap/pump daily for a 20-24 lb. dog 2 caps/pumps daily for a 40-48 lb. dog 3 caps/pumps daily for a 60-72 lb dog 4 caps/pumps daily for a 80-96 lb. dog 5 caps/pumps daily for 100-120 lb. dog	APPROVED NOT TESTED APPROVED
Super Strength Products (600+ mg total EPA + DHA)	For all size dogs	
TwinLab Mega Twin Epa (Fish Oil)	EPA 600 + DHA 240 = 840 mg 1 cap daily for 27-33 lb dog 2 caps daily for 55-67 lb dog 3 caps daily for 83-100 lb dog	NOT TESTED
DVM 3V-Caps HP Liquid (2 ml per pump)	EPA 540 + DHA 360 = 900 mg 1 pump daily for a 30-36 lb. dog 2 pumps daily for a 60-72 lb. dog 3 pumps daily for a 90-108 lb dog	NOT TESTED
Carlson® Norwegian Cod Liver Oil	EPA 460-550 + DHA 500-550 = 960-1100 mg per 5 mL (tsp.) 1 mL per 8 lbs. Body weight daily	APPROVED
Nordic Naturals® Pet Cod Liver Oil	EPA 700 + DHA 750 = 1450 mg per 5 mL (tsp.) 1 mL per 10 lbs. body weight daily	NOT TESTED

Products OK for skin conditioning, Not Recommended for Inflammatory Disease (omega6:omega3 < 3:1)	EPA and DHA Per Softgel	TEST RESULTS:
Low-Dose Products (less than 250 mg total EPA + DHA)	For cats and small dogs	
GNC Preventive Nutrition® Omega Complex LA 154.3mg + GLA 60mg = 214.3mg Omega6:omega3 = 2.14:1	EPA 60 + DHA 40 = 100 mg	APPROVED
Health From The Sun The Total EFA™, Flax, Fish, Borage 1200 mg * GLA 96 mg + LA 210 mg = 306mg Omega6:omega3 = 2.55:1	EPA 72 + DHA 48 = 120 mg	APPROVED
DVM 3V Caps Skin Formula for Small and Medium Dogs Contains safflower oil and borage seed oil, no info on how much omega-6 Can't calculate ratio, but fish oil first ingredient	EPA 103 + DHA 68 = 171 mg	NOT TESTED
DVM 3V Caps Liquid Skin Formula Contains safflower oil and borage seed oil, no info on how much omega-6 Can't calculate ratio, but fish oil first ingredient	EPA 113 + DHA 77 = 190 mg	NOT TESTED
Rexall® Flax, Fish, Borage Oil Omega-6 Fatty Acids: 276mg, LA 180mg, GLA 96mg = 552mg Omega6:omega3 = 2.76:1 VetriScience OMEGA 3, 6, 9 ALA 169.6 mg + LA 166.6 mg + GLA 60.8 mg = 397 Omega6:omega3 = 1.98:1	EPA 80 + DHA 120 = 200 mg EPA 120 + DHA 80 = 200 mg	APPROVED APPROVED
Regular Strength Capsules (250-400 mg total EPA + DHA)	For medium sized dogs	
Cardiovascular Research Ltd MaxEPA™ Marine Lipid Concentrate GLA 300mg Omega6:omega3 = 1:1 DVM 3V Caps Skin Formula for Medium and Large Dogs Contains safflower oil and borage seed oil, no info on how much omega-6 Can't calculate ratio	EPA 180 + DHA 120 = 300 mg	APPROVED NOT TESTED
Extra Strength Capsules (400-600 mg total EPA + DHA)	For large dogs	
DVM 3V Caps Skin Formula for Large and Giant Dogs Contains safflower oil and borage seed oil, no info on how much omega-6 Can't calculate ratio	EPA 250 + DHA 167 = 417 mg	NOT TESTED
Nutramax Welactin (1 serving = 1 teaspoon) Contains soybean oil	EPA 174 + DHA 276 = 450 mg	NOT TESTED
The Vitamin Shoppe™ Essential Oils & Fatty Acids EPA- DHA Omega-3 Fish Oil 500 Contains soybean oil	EPA 300 + DHA 200 = 500 mg	APPROVED
Coromega™ omega-3 Fish Oil* Contains vegetable oil	EPA 350 + DHA 230 = 580 mg	APPROVED

Products Not Recommended Due to Low or Undocumented Levels of DHA/EPA, or omega6:omega3 > 3:1	TEST RESULTS:
Derm-Form Chewable Tablets – each tablet contains less than 3 mg fatty acids	UNTESTED
Derm-Tabs for Dogs – each tablet 12 mg omega-3, 40 mg omega-6; Omega6:omega3 = 3.3:1.	UNTESTED
Derm-Tabs ES (Extra Strength) for Dogs – per tablet 450 mg fish oil and 100 mg flaxseed oil no info on how much DHA/EPA	UNTESTED
DVM Derm Caps ES (Extra Strength) Medium Large – per capsule LA 491.4mg, GLA 37.8mg = 529.2mg EPA 76 + DHA 47 = 123 mg Omega6:omega3 = 4:1	UNTESTED
DVM Derm Caps ES Liquid LA 52% + GLA 4% = 56% EPA 8% + DHA 6% = 14% Omega6:omega3 = 4:1	UNTESTED
DVM Derm Caps Liquid – per teaspoon 3550 mg LA + 100 mg GLA = 3650mg 200 mg EPA + 150 mg DHA = 350mg Omega6:omega3 = 10.4:1	UNTESTED
DVM Derm Caps RS (Regular Strength) Small Medium– 71% LA, + 2% GLA = 73% 4% EPA + 3% DHA = 7% Omega6:omega3 = 10.4:1	UNTESTED
Lipiderm Feline Liquid	UNTESTED
Lipiderm Gel Capsules for Large Dogs EPA 10.8% + DHA 6.7% = 17.5% DPA 2.7% + ALA 10% + LA 3.2% = 15.9% No absolute values provided	UNTESTED
Lipiderm Gel Capsules for Small to Medium Dogs EPA 7.7% + DHA 5.7% = 13.4% DPA 1.0% + ALA 1% + LA 0.5% = 2.5% No absolute values provided	UNTESTED
Lipiderm Liquid LA 0.4% + ALA 0.7% = 1.1% EPA 2.25% + DHA 1.8% = 4.05% No absolute values provided	UNTESTED
Missing Link – no information about EPA/DHA on the label	UNTESTED
OmegaMAXX - no information about EPA/DHA on the label	UNTESTED
Puritans Pride Triple Omega 3-6-9 Flax Fish & Borage Oil - Omega-6 Fatty Acids 276mg + LA 1800mg + GLA 96mg = 2172mg EPA + DHA = 200 mg Omega6:omega3 = 10.86	APPROVED
Virbac Allerderm EFA-CAPS – 48 mg omega-6 130 mg omega-3 no info on how much EPA/DHA Omega6:omega3 = <1:1	UNTESTED

Products Not Recommended Due to Low or Undocumented Levels of DHA/EPA, or omega6:omega3 > 3:1	TEST RESULTS:
Virbac Allerderm EFA-CAPS HP 87 mg omega-6 200 mg omega-3 no info on how much EPA/DHA Omega6:omega3 = <1:1	UNTESTED
Virbac Allerderm EFAVite – 92 mg omega-6 85 mg omega-3 no info on how much EPA/DHA Omega6:omega3 = 1.1:1	UNTESTED
Virbac Allerderm EFAVite HP 170 mg omega-6 178 mg omega-3 no info on how much EPA/DHA Omega6:omega3 = 1:1	UNTESTED
Virbac Allerderm EFA-Z Plus No omega-3's, LA only Linoleic Acid - 457 mg/ml	UNTESTED
Virbac Allerderm Omegaderm for Small Cats and Dogs LA 368mg + GLA 7 mg = 375mg EPA 38mg + DHA 26mg = 64mg Omega6:omega3 = 5.9:1	UNTESTED
Virbac Allerderm Omegaderm for Dogs Over 20 lbs LA 736mg + GLA 14 mg = 750mg EPA 76mg + DHA 52mg = 128mg Omega6:omega3 = 5.9:1	UNTESTED
Vitamin World Triple Omega 3-6-9 Flax Fish Borage Oil 276mg + LA 1800mg + GLA 96mg = 2172mg EPA + DHA = 200 mg Omega6:omega3 = 10.86:1	APPROVED

Commercial Diets - Canine	mg n-6/100 kcal	mg n-3/100 kcal	n-6:n-3 (ideal < 5:1 to 9:1)
Hill's Prescription Diet			
a/d, canned	1148	521	2.2:1
d/d canine Lamb & Rice, canned	946	158	6.0:1
d/d canine Whitefish & Rice, canned	1052	178	5.9:1
d/d canine Duck & Rice, dry	761	75	10.1:1
d/d canine Egg & Rice, dry	948	95	10.0:1
d/d canine Salmon & Rice, dry	544	217	2.5:1
g/d canine, canned		177	
g/d canine, dry		198	
j/d canine, canned	684	1011	0.7:1
j/d canine, dry	672	948	0.7:1
k/d canine, canned		458	
k/d canine, dry		348	
n/d canine, canned	462	1348	0.3:1
z/d canine, dry	1268	165	7.7:1
z/d Ultra canine, dry	1088	134	8.2:1
Hill's Science Diet			
Active , dry	3727	411	9:1
Light Maintenance, dry	1043	107	9.7:1
Maintenance, dry	908	132	6.9:1
Maintenance Lamb & Rice, dry	942	167	5.6:1
Senior, Dry	810	282	2.9:1
Sensitive Skin Dog, dry	1232	361	3.4:1
Other Brands	Mg n-6/serving	Mg n-3/serving	
Iams Eukanuba Maintenance, dry	4638	840	5.6:1
Iams Eukanuba Reduced Fat, dry	3564	648	5.5:1
Iams Eukanuba Maximum Calorie, canned	6342	768	8.3:1
Iams Eukanuba Maximum Calorie, dry	5418	1056	5.1:1
Iams Eukanuba Response FP, canned	9360	1284	7.3:1
Iams Eukanuba Response FP, dry	2352	438	5.4:1
Iams Eukanuba Response KO, dry	4452	564	7.9:1
IVD Duck & Potato, dry	2280	450	5.1:1
NutroMax Special, dry	3634	158	23:1
NutroMax, dry	5460	280	19.5:1
Purina Dog Chow	3160	158	20:1
Purina LA Formula, dry	1680	1680	1:1

Commercial Diets - Feline	mg n-6/100 kcal	mg n-3/100 kcal	n-6:n-3 (ideal < 5:1 to 9:1)
Hill's Prescription Diet			
a/d, canned	1148	521	2.2:1
d/d feline, canned		105	
g/d feline, canned		152	
k/d feline, canned		125	
k/d feline chicken, canned		162	
z/d feline, dry	1240	161	7.7:1
Hill's Science Diet			
Sensitive Skin, dry	1201	113	10.6:1