AlphaVet Science™

Omega 3/6/9-VM™

Essential Fatty Acids Formula **NN.Z8C6**

Omega 3/6/9-VM™ is a synergistic blend of fatty acids consisting of ω–3, ω–6, and ω–9 derived from *Scomber scombrus, Sardina pilchardus, Engraulis ringens, Linum usitatissimum, Helianthus annuus,* and *Borago officinalis,* with mixed tocopherols.

INDICATION
- Source of Essential Fatty Acids (Omega 3-6-9) to support a healthy pelage

INGREDIENTS ACTION
- Dermotropic

PACKAGING 500 mL/bottle

ADMINISTRATION Mix recommended dose with food. Shake well before use. For use in cats & dogs only.

DOSAGE

GIVE 1-2 TIMES PER DAY			
LBS	**KG**	**RECOMMENDED DOSAGE**	
		mL	**Teaspoon(s)**
1-10	0.5-4.5	1.25	¼
11-20	5-9.1	2.5	½
21-50	9.5-22.7	5	1
51-75	23.1-34	7.5	1½
76-100	34.5-45.4	10	2
>100	45.4	15	3

STORAGE Refrigerate after opening. Consume within six (6) months after opening. Keep bottle cap tightly closed when not in use.

Omega 3/6/9-VM™ FORMULA

MEDICINAL INGREDIENTS PER 1 TEASPOON (5 mL):

Proprietary Blend of Omega 3-6-9 Essential Fatty Acids

Linum usitatissimum (Flax Seed Oil)	2.4 mL
Helianthus annuus (Sunflower Seed Oil)	1.5 mL
Fish Oil (Anchovy, Mackerel, Sardine)	0.8 mL
Borago officinalis (Borage Oil)	0.003 mL
Omega 3	1500 mg
ALA (alpha-Linolenic acid)	1000 mg
EPA (Eicosapentaenoic acid)	300 mg
DHA (Docosahexaenoic acid)	200 mg
Omega 6	1250 mg
Omega 9	850 mg

NON-MEDICINAL INGREDIENTS

Vitamin E (Mixed Tocopherols)

Omega 3/6/9-VM™ is manufactured under strict GMP standards and contains no corn, dairy, gluten, soy, wheat or yeast.

Dogs and cats, among other species, are unable to synthesize essential fatty acids such as omega-3 and omega-6 fatty acids (Davenport, 2006). Essential fatty acids are crucial for proper cellular development, reproductive, gastrointestinal, and renal functions, and maintenance of healthy skin. Diets deficient in essential fatty acids can result in cutaneous disorders in adult animals, as well as a failure to thrive in young growing animals (Biagi et al., 2004; Bauer, 2006; Davenport, 2006; Bauer, 2008; Neukam et al., 2011; Parikh et al., 2019).

Linum usitatissimum (Flax Seed Oil)

Flax oil is extracted from the seeds of *Linum usitatissimum* L. (Linaceae). It is a rich source of the essential fatty acids alpha-linolenic acid (ALA) [omega-3 fatty acid], linoleic acid (omega-6 fatty acid), and the nonessential fatty acid, oleic acid (omega-9 fatty acid) [Basch et al., 2007). The approximate composition of omega-3 fatty acid in flax seed oil is 57% and omega-6 fatty acid is 15% (Saleh-Ghadimi et al., 2020; Shahid et al., 2020).

TOXICOLOGY

The toxicity for flax seed oil has not been documented in dogs and cats when administered orally in therapeutic doses.

However, there are several potential adverse effects of high-level dietary supplementation of omega-6 and omega-3 fatty acids. Most of these are dose- and duration-dependent side effects that include gastrointestinal upset, diarrhea, pancreatitis, altered platelet function, delayed wound healing, lipid peroxidation, weight gain, altered immune function, and the effects on glycemic control and insulin sensitivity (Lenox & Bauer, 2013).

DRUG INTERACTIONS

Validated interactions studies do not exist for flax seed oil. Clinical interactions with other drugs have not been reported.

In theory, flax seed oil may increase the risk of bleeding when taken with anticoagulants or antiplatelet drugs; may potentiate the blood pressure-lowering effects of antihypertensive agents; and flax seed oil may cause hyperglycemia and can counter the effects of hypoglycemic agents (Basch et al., 2007).

Helianthus annuus (Sunflower Seed Oil)

Sunflower oil is extracted from the seeds of *Helianthus annuus* L. (Compositae [Asteraceae]). The seeds contain 35% to 42% oil, that contains 55% to 70% linoleic acid (omega-6 fatty acid) and 20% to 25% oleic acid (omega-9 fatty acid) [Guo et al., 2017].

Sunflower seed oil is also a source of mixed tocopherols. The content of tocopherol in sunflower seed is 300 mg to 1800 mg/kg that comprises of alpha-tocopherol (92.4%), beta-tocopherol (5.6%), and gamma-tocopherol (2.0%) [Guo et al., 2017].

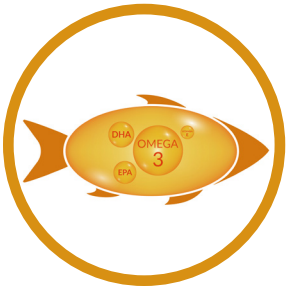
TOXICOLOGY

The toxicity for sunflower seed oil has not been documented in dogs and cats when administered orally in therapeutic doses.

DRUG INTERACTIONS

Validated interactions studies do not exist for sunflower seed oil. Clinical interactions with other drugs have not been reported.

Fish Oil (Anchovy, Sardine, Mackerel)



The lipid content in anchovy, sardine and mackerel are 1.97 ± 0.14%, 3.68 ± 0.17%, and 5.03 ± 0.87%, respectively (Sumi et al., 2016).

Fish body oil is the source of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Supplementation with EPA and DHA is helpful in several human disorders, such as diabetes, cardiovascular problems, psychiatric and psychological disturbances, rheumatoid arthritis and cancer. Regarding veterinary patients, inflammatory skin disorders, cardiovascular conditions, renal disease and osteoarthritis are the major non-neoplastic diseases where the EPA and DHA seem to have the most impact. Besides, omega-3 fatty acid supplementation is beneficial as an adjuvant treatment of neoplastic diseases (Magalhaes et al., 2021).

TOXICOLOGY

The toxicity of fish oil has not been documented in dogs and cats when administered orally in therapeutic doses.

Note: Some species of fish may contain significant levels of methylmercury, polychlorinated biphenyls (PCBs), or other environmental contaminants (Mozaffarian & Rimm, 2006). In general, larger predatory fish tend to contain the highest levels of these contaminants. However, several independent laboratory analyses have found commercially available omega-3 fatty acid supplements are free of contaminants (Melanson et al., 2005).

DRUG INTERACTIONS

Validated drug interaction studies do not exist for fish oil preparations in canine and feline patients.

Note: A literature search identified only three case reports presenting bleeding events or changes in laboratory results in human patients taking fish oil and anticoagulant medications (Jalili & Dehpour, 2007; McClaskey & Michalets, 2007; Buckley et al., 2004). However, one small study found that 3 g/day or 6 g/day of fish oil did not affect INR values in ten human patients on warfarin over four weeks (Bender et al., 1998).

Borago officinalis (Borage Oil)

Borage oil is extracted from the seeds of *Borago officinalis L.* (Boraginaceae). It is a rich source of gamma-linolenic acid (26%), linoleic acid (38%) and oleic acid (16%) [Eskin, 2008; Asadi-Samani et al., 2014]. Other fatty acids include palmitic acid (10%-11%), stearic acid (3.5%-4.5%), eicosenoic acid (3.5%-5.5%) and erucic acid (1.5%-3.5%) [Asadi-Samani et al., 2014].

Borage oil exhibits excellent health-promoting properties. Gamma-linolenic acid from borage oil is beneficial in degenerative pathologies such as diabetes, osteoporosis, or cancer. It is also helpful in arthritis, skin disorders, reproductive disorders, cardiovascular diseases, and neurological problems (Tasset-Cuevas et al., 2013; Casas-Cardoso et al., 2021).

TOXICOLOGY

The toxicity for borage seed oil has not been documented in dogs and cats when administered orally in therapeutic doses.

Note: Status epilepticus is reported in a human patient who consumed borage oil from 1500 mg to 3000 mg/day for one week (Al-Khamees et al., 2011).

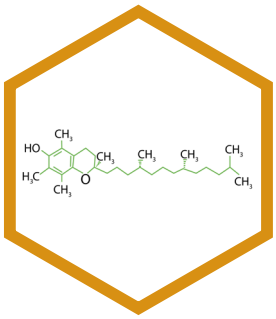
DRUG INTERACTIONS

Validated interactions studies do not exist for borage seed oil. Clinical interactions with other drugs have not been reported.

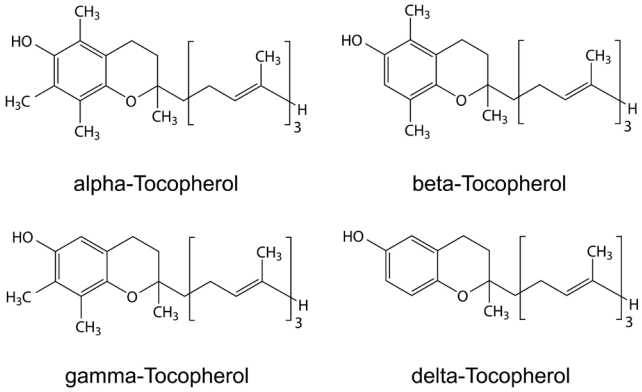
Skin and Hair Coat – Canine and Feline Studies of Essential Fatty Acids (Flax, Sunflower, Borage, and Fish Oil Combinations)

Studies-Canine	Study Title	Study Summary
Campbell et al., 1992	Effects of Oral Sunflower Oil on Serum and Cutaneous Fatty Acid Concentration Profiles in Seborrheic Dogs.	Supplementation with oral sunflower oil for 30 days in seborrheic dogs, the cutaneous fatty acid concentration profiles returned to near normal values and clinical signs of seborrhea lessened in severity.
Harvey, 1993	Effect of varying proportions of evening primrose oil and fish oil on cats with crusting dermatosis ('miliary dermatitis').	The cutaneous signs improved when the cats were supplemented with either evening primrose oil alone or with a combination of evening primrose oil and fish oil.
Logas & Kunkle, 1994	Double□blinded Crossover Study with Marine Oil Supplementation Containing High□dose Ecosapentaenoic Acid for the Treatment of Canine Pruritic Skin Disease.	The double-blinded crossover study evaluated the effects of omega-3 fatty acids in dogs with idiopathic pruritus, atopy, and flea allergy. Dogs receiving omega-3 fatty acids had significantly improved pruritus, alopecia, and coat character.
Lechowski et al., 1998	The effect of the addition of oil preparation with increased content of n-3 fatty acids on serum lipid profile and clinical condition of cats with miliary dermatitis.	In cats with miliary dermatitis, supplementation with fish oil improved the clinical signs. The study concluded that cats with miliary dermatitis require higher omega-3 fatty acids in their diet.
Mooney et al., 1998	Evaluation of the effects of omega-3 fatty acid-containing diets on the inflammatory stage of wound healing in dogs.	The study concluded that a diet rich in omega-6 and omega-3 controls inflammation associated with wound healing and can be beneficial in dermatologic conditions in dogs.
Harvey, 1999	A blinded, placebo-controlled study of the efficacy of borage seed oil and fish oil in the management of canine atopy.	In the blinded, placebo-controlled study, canine atopy patients supplemented with fish oil and borage oil showed a significant decrease in erythema and self-trauma.
Rees et al., 2001	Effects of dietary flax seed and sunflower seed supplementation on normal canine serum polyunsaturated fatty acids and skin and hair coat condition scores.	The study concluded that a one-month supplementation with either flax seed or sunflower seed in dogs improved skin and hair coat.

Muller et al., 2004	Effect of omega-3 fatty acids on canine atopic dermatitis.	In a double-blinded, place-controlled, randomized trial with 29 atopic dogs, supplementation with flax oil and fish oil improved clinical scores compared to placebo.
Abba et al., 2005	Essential fatty acids supplementation in different-stage atopic dogs fed on a controlled diet.	In a two-month trial of 22 non-seasonal atopic dogs, supplementation of omega-6 and omega-3 at a 5.5:1 ratio was beneficial in the early stages of the disease.
Bensignor et al., 2008	Efficacy of an essential fatty acid-enriched diet in managing canine atopic dermatitis: a randomized, single-blinded, cross-over study.	In canine subjects with perennial atopic dermatitis, omega-3 fatty acids enriched diet reduced pruritus and improved clinical lesions.
Kirby et al., 2009	Skin surface lipids and skin and hair coat condition in dogs fed increased total fat diets containing polyunsaturated fatty acids.	Canine patients fed with higher amounts of omega-3 fatty acids for 12 weeks showed significant improvements in their hair coat glossiness and softness.
Singh et al., 2010	Therapeutic management of canine atopic dermatitis by combination of pentoxifylline and PUFAs.	The study concluded that a combination of pentoxifylline and polyunsaturated fatty acids (PUFAs) can be used as an alternative modality to manage canine atopic dermatitis (CAD) with a higher recovery rate. It can also be recommended as an adjuvant therapy along with the main therapeutics of CAD, such as cyclosporine and glucocorticoids.
Park et al., 2011	Dietary fish oil and flaxseed oil suppress inflammation and immunity in cats.	Dietary fish oil and flaxseed oil decreases skin inflammatory response to histamine. The study concluded that fish oil was more effective than flaxseed oil in reducing skin inflammatory responses.
Popa et al., 2011	Analysis of epidermal lipids in normal and atopic dogs, before and after administration of an oral omega-6/ omega-3 fatty acid feed supplement.	Long-term supplementation with omega-6 and omega-3 essential fatty acids in canine atopic dermatitis resulted in a significantly improved organization of the lamellar lipids in the lower stratum corneum.
Kang et al., 2018	Mackerel-Derived Fermented Fish Oil Promotes Hair Growth by Anagen-Stimulating Pathways.	Mackerel-derived fermented fish oil and DHA promote hair growth through the anagen-activating pathways in dermal papilla cells.



Mixed Tocopherols (Vitamin E)



Mixed tocopherols are the collective term for a family of chemical substances that are structurally related to alpha-tocopherol. Increasing the dietary polyunsaturated fatty acid content simultaneously increases the requirement for vitamin E (Wander et al., 1997). Appropriate levels of fish oil and vitamin E have been shown to increase life span, improve life quality, reduce symptoms and physical evidence of disease, and decrease mortality rates in dogs with heart disease (Dove, 2001). A wide range of clinical signs of vitamin E deficiency in dogs has been reported: degeneration of skeletal muscles associated with muscle weakness and reproductive failure in male and females, subcutaneous edema, anorexia, depression, dyspnea, and eventual coma. Vitamin E deficiency in cats has been associated with depression and anorexia, hyperesthesia on palpation of the ventral abdomen, and nodular adipose tissue (NRC, 2006).

TOXICOLOGY

Toxicity for mixed tocopherols has not been documented in dogs and cats when administered orally in therapeutic doses. However, a study in kittens suggested that toxicity of vitamin E was dose related. No mortality occurred at 5 mg/kg/day of dl-α-tocopherol intramuscular or subcutaneous, but significant mortality occurred at doses equivalent to 100 to 200 mg/kg/day and a dose of 1000 mg/kg/day caused death in all kittens in the study (NRC, 2006). The acute oral LD50 value of all-rac-α-tocopheryl acetate for rats, mice, and rabbits, has been estimated to be in excess of 2 g/kg (NRC, 1987).

DRUG INTERACTIONS

Validated interactions studies do not exist for vitamin E preparations. Clinical interactions with other drugs have not been reported. However, it has been reported that vitamin E at doses greater than 400 IU per day may increase the effect of anticoagulant drugs, although data are inconsistent (Kim & White, 1996; Corrigan & Marcus, 1974).

A number of medications may decrease the absorption of vitamin E, including cholestyramine, colestipol, isoniazid, mineral oil, orlistat, sucralfate, and the fat substitute, olestra. Anticonvulsant drugs, such as phenobarbital, phenytoin, or carbamazepine, may decrease plasma levels of vitamin E (Hendler & Rorvik, 2001).

PRECAUTIONS

- Do not use in immature, pregnant or lactating animals.
- Do not use in animals with gastrointestinal disease or receiving other drugs, unless directed by a veterinarian.
- Use with caution in animals with loose stools.
- Not to be used one week prior to surgery.
- Consult your veterinarian for potential drug interactions.
- Off-label use of this product in ruminants is not recommended.
- Oral use only.
- Administer during or after the animal has eaten to reduce incidence of gastrointestinal upset.
- Do not exceed recommended dose.
- Shake well before use.
- Do not use if security seal is broken.

WARNINGS

- To be used in dogs and cats only.
- Keep out of the reach of children and animals.
- In case of accidental overdose, contact a health professional immediately.

ADVERSE REACTIONS

- Mild gastrointestinal discomfort may occur which is dose dependent.

CONTRAINDICATIONS

- Contraindicated in pregnant and nursing dogs and cats.

DURATION OF USE

- Not for long term use, unless directed by a veterinarian.

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