



Light on Omega-3 & Omega-6 Fatty Acids

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Abstract

Omega-3 & Omega-6 are essential unsaturated fatty acids. *Acharya Charak* has described about *Sneha* in *Charak samhita, sutra sthana*, and chapter 13/38-40. According to *Acharya Charak*, *Haswa matra of sneha* should be taken daily for all age groups. Similarly, Omega-3 & Omega-6 fatty acids found in various types of *sneha (ghrita, taila, vasa, majja)* like oil, butter, fishes, oily substances of different food materials also. The world is facing with many lifestyle disorders like Diabetes, Obesity, Hypertension, Cardiac diseases and many more diseases. These are due to unhealthy lifestyle and diet. In this article, we will highlight the concept of Omega 3 & Omega 6 fatty acids, which plays an important role in diet and many lifestyle disorders and how its ratio can cure us from many lifestyle disorders.

Alpha linolenic acid (ALA) intake should be 1.6 gm/day in male and 1.1 gm/day in female. People should consume 2% of their total daily calories from Omega-3 fats. Omega-3 is helpful to reduce inflammation, prevent from excessive clotting, lower the level of cholesterol etc. Omega-6 is helpful in growth, especially for brain and muscle development. With the help of correct ratio of Omega-3 & Omega-6 fatty acids, we can cure and avoid various diseases like Alzheimer's diseases, Asthma, Diabetes etc.

In this article, we will describe how to lower excess Omega-6 and how to increase your Omega-3 for obtaining the correct ratio of these fatty acids. People should always include foods like *Akharota* (walnuts), *Alasi* (Flax seeds), fishes, and vegetables in their regular diet. This topic has been chosen because it is easy for Ayurveda physicians to maintain the correct ratio of Omega-3 and Omega-6 fatty acids in patient's regular diet as *Pathya-Apathya* concept.

Keywords

Omega-3, Omega-6, Fatty acids, *Sneha*, *Pathya*

INTRODUCTION

Omega 3 & Omega 6 are essential unsaturated fatty acids. Essential fatty acids meaning that they can't be synthesized by the human body, except that mammals have a limited ability. Omega-3 fatty acids refer to a group of three fats called Alpha linolenic acid (ALA), Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA). In

Omega-6 fatty acid, Linoleic acid is converted to gamma-linolenic acid (GLA) in the body. It is then further broken down to Arachidonic acid (AA). The nomenclature of the fatty acid is taken from the location of the first double bond, counted from the methyl end that is, the omega (ω -) or the n-end. Omega 3 & Omega 6 both are fatty

acids, but each one has a different role in keeping your body performing at its absolute best.^[3-6]

Acharya Charak has described about *Sneha* in *Charak samhita, Sutra sthan*, chapter 13/38-40^[1,2]

“Ye tu vriddhascha balascha sukumarah sukhochitah,

Riktakoshthatwasahitam tesham mandagnayascha ye.

Jwaratisarkasascha yesham

chirsamutthitah,

Snehmatram pibeyuste haswa ye chawara bale.

Parihare sukha chaisha matra snehan brihani,

Vrishya balya nirabadha chiram chapyanuvartate” (Ch. Su. 38-40)

It means, The old, the children, those with tender health, those who have been brought up in luxury, those for whom evacuation of bowel is not good, those whose power of digestion is weak, those who are chronic patients of fever, diarrhoea and cough, and those who are very weak, are advised to use oleation therapy in its third (inferior) type of dosage. This requires the least precautions; this helps oleation, nourishment, thus stimulates libido and gives strength. This is least harmful and can be continuously administered for a long time⁽⁵⁵⁾.

According to *Acharya Charak*, *Haswa matra of sneha* should be taken daily for all age groups. Similarly, Omega-3 & Omega-6 fatty acids found in various types of *sneha* (*ghrita, taila, vasa, majja*) like oil, butter, fishes, oily substances of different food materials should be taken daily for all age groups. In present era, several diseases like Diabetes, Asthma, and Obesity etc. are because of faulty dietary habits. It has indicated in almost all ‘*Samhitas*’ and text books related to health that diet plays an important role in promotion of health and prevention of diseases. A nutritionally balanced diet has very important role for the health of a person, *Ahara* (diet) is main content of *Triyaupastambha*^[7] (*aahara, nidra, brihmacharya*) of ayurveda also. In this article, attention has been drawn regarding the importance and essentiality of Omega-3 & Omega-6 fatty acids in your regular diet.

Effects of Omega-3 fatty acids^[8-16]

- Reduce inflammation throughout the body.
- Lower the elevated levels of cholesterol & triglycerides.
- Decrease platelet aggregation and prevent from excessive blood clotting.



- Reduce the production of cytokines which are involved in the inflammatory response associated with atherosclerosis.
- Reduce the risk of becoming obese.
- Inhibit thickening of arteries by decreasing endothelial cells by production of a platelet derived growth factor.
- Improves response to insulin by stimulating the secretion of leptin hormone.
- Helps to prevent from cancer cell growth.

Effects of Omega-6 fatty acids ^[17-20]

- Benefits of Omega-6 manifests on a cellular level because it plays an important role as a messenger.
- Promotes cell growth, especially for brain and muscle development. Arachidonic acid therefore is added to many infant formulations.
- Body builders and athletes consume Omega-6 supplements for their muscle development.
- Omega-6 takes part in PGE₁ & PGE₂ series of prostaglandin formation, where PGE₁ reduces fluid accumulation, impact depression, post menopausal mood swings and

PGE₂ promotes swelling, pain, blood thinning, blood vessels spasm etc.

PUBLIC HEALTH

RECOMMENDATION ^[26-30]

In 2002, the Institute of Medicine at the National Academy of Sciences issued Adequate Intake (AI) levels for ALA. The intake of ALA should be 1.6 gm/day in male teenagers and adults and 1.1 gm/day in female teenagers and adults. Guidelines issued by the workshop on the Essentiality of Recommended dietary Intakes (RDI) for Omega-3 fatty acids in 1999 sponsored by the National Institute of Health (NIH) has following outcome. People should consume 2% of their total daily calories from Omega-3 fats. For example, if 2000 calories is being consumed, then 4gm must be consumed from Omega-3 fatty acids. Some other recommendations are-

Organization	Year	Ratio
		(Omega6: Omega 3)
National Institute of Health (NIH)	2001	1:1
Japanese government	2007	4:1
Sweedish government	---	5:1
National Academy of Science (U.S.)	---	10:1

SOURCE FOR OMEGA-3 & OMEGA-6 ^[21-25]

The following ratio of Omega-6 & Omega-3 is found in some oils, nuts, seed, animal fats, vegetables and beans:

Oils (1 Tbsp)	Nuts & Seeds (1 oz = 28ml)	Animal fat (4 oz = 115gm)	Vegetables & Beans (½ cup)
Cod liver oil 0.1:1	Flax seeds 0.2:1	Salmon, fresh, frozen 0.0:1	Green leaf lettuce, fresh, raw 0.5:1
Flax seed oil 0.3:1	Walnuts 4.2:1	Tuna, canned in water, drained 0.1:1	Turnip greens, cooked 0.5:1
Canola oil 2.2:1	Pecans, dry roasted 2:1	Crab, soft shell,cooked 0.0:1	Mustard greens, cooked 0.5:1
Mustard oil 2.6:1	Pistachios, roasted 55.3:1	Butter oil 1.8:1	Red leaf lettuce, fresh, raw 1.5:1
Walnut oil 5.1	Sesame seeds 55.7:1	Egg 15:1	Soybean, dried, cooked 7.4:1
Soybean oil 7.5:1	Pumpkin seeds, shelled 107.8:1	Tofu 7.5:1	Spinach fresh, cooked 0.2:0
Olive oil 13.4:1	Chia seeds 0.3:1	Tuna, canned in oil,drained 13.8:1	Collard greens, cooked 0.8:1

DEFICIENCY SYMPTOMS ^[31-35]

Omega-3 deficiency causes fatigue, itchy skin, brittle hair, brittle nails, joint pain, constipation, frequent colds, depression, poor concentration, lack of physical endurance etc. and Omega-6 deficiency causes skin eruptions, hair loss, behavioral changes, dry glands, male sterility, growth retardation, dry skin, dry eyes, miscarriage, irregular heart beat etc.

**PREVENTION AND
TREATMENT** ^[36-40]

With the help of correct ratio of Omega-3 & Omega-6 fatty acids, we can cure and avoid various diseases such as Alzheimer's disease, asthma, attention deficit hyperactivity disorder, cardiovascular diseases, cancer, depression, diabetes, eczema, migraine, obesity, osteoarthritis, psoriasis, rheumatoid arthritis, schizophrenia, dementia, colon cancer, breast cancer, irritable bowel syndrome etc.

CONVERSION ^[41, 42]

In Omega-3 ALA converts into DHA & EPA, which are helpful in cardiac disorders

and useful for brain and nerve development. In Omega-6, LA converts into gLA and then AA. Delta-6 desaturase enzyme is responsible for both conversions. If more Omega-6 is consumed than Omega-3, then it causes inflammation and pain and if these sensation had not turned off by receptors of Omega-3 fats caused chronic inflammatory diseases.

EXCESS OF OMEGA-6 WORKS AS A SILENT KILLER ^[43-45]

This is a typical change of events:

1. The system is challenged by a virus attack, an allergy response, or oxidative stress (ROS or Reactive Oxygen Species).
2. To respond to the attack, the fats in the cell membranes are used to make messengers.
3. The fats in the cells have too much Arachidonic acid (AA).
4. The fats in the cells are deficient in Omega-3 EPA because
 - i) We did not consume enough fish, fish oil etc,
 - ii) The vegetable oil Alpha linolenic acid was not efficiently converted to EPA because the delta 6 converter was used for the massive corn oil to

Arachidonic acid conversion. (Means Omega-6 conversion)

5. Because the PGE₂ pain messengers, made from Arachidonic acid, are not stopped with PGE₃ antidote from EPA, we can't bear the pain and we take a painkiller.
6. The painkiller kills the pain by inhibiting the COX pathway, but we pay a hefty price in the form of uncontrolled inflammation: leukotriene inflammation that is 10,000 times stronger.
7. The massive inflammation, albeit painless, causes over time an epidemic of heart disease, diabetes and obesity etc.
8. This is why corn oil and soybean oil (Omega-6 is in higher ratio than Omega-3) are silent killers.

Reduce excess Omega-6 fatty acid ^[46-48]

- Change your cooking oil, don't use cottonseed oil, soybean oil and corn oils, you should use mustard oil, flax seeds oil, olive oils for cooking.
- Avoid deep fried foods which can cause cancer.
- Limit processed foods due to cheap vegetable oils.

- Be careful of food dressings, alternative healthier oils should be used.
- Scrutinize food labels to manage the ratio of both fatty acids.

Increase OMEGA-3 fatty acid ^[49-51]

- Choose foods which are rich sources of Ecosapentaenoic acid & Docosahexaenoic acid.
- Should not avoid Alpha linolenic acid food resources which are mostly plants, because it had also important sources of vitamins and minerals.
- Ecosapentaenoic acid & Docosahexaenoic acid (EPA & DHA) supplements intake if required.

- To increase the activity of Delta-6 desaturase enzyme, for balance the correct ratio of both fatty acids, people should consume vitamin B3, vitamin B6, vitamin C, manganese & zinc also. ^[52,53,54]

CONCLUSION

People should always include foods like *Akharota* (walnuts), *Alasi* (flax seeds), fresh fruits, vegetables and fishes in their regular diet. Ayurveda physicians must maintain the correct ratio of Omega-3 and Omega-6 fatty acids in patient's regular diet as *pathya-apathya* concept. It will be very helpful for healthy human beings and for patients to get better cure from disease and keep them healthy.

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