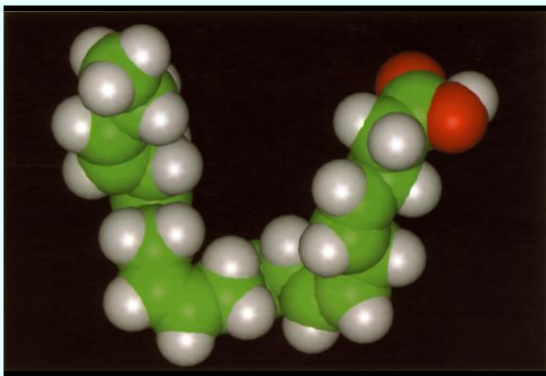
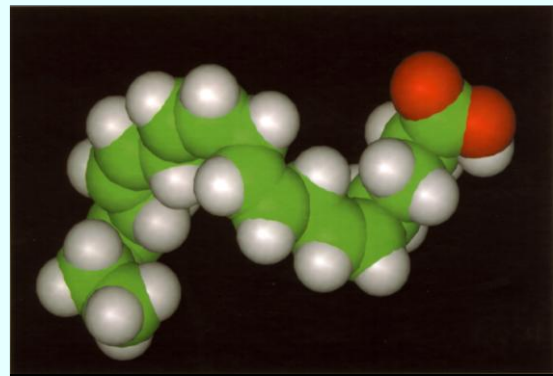


DHA, EPA and Metabolic Syndrome

Three Dimension Structure (3D Simulation) of DHA and EPA



DHA



EPA

●: Carbon, ●: Oxygen, ○: Hydrogen

DHA & EPA Association

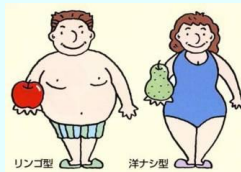
What is Metabolic Syndrome?

- ◇ Metabolic Syndrome is the **Visceral Fat Type Syndrome** to raise the Risk of the Arteriosclerosis Disease (Myocardial Infarction).
- ◇ A food Satiation, Lack of Physical Activity, and an Excessive Stress, and so on, are Main Cause of this Problem. In Recent Years, the Arrivals of an Aging Society make this Problem a Bigger Thing.

Diagnostic Criteria of Metabolic Syndrome

Visceral Fat Accumulation

Waist Girth **Males ≥85cm**
Females ≥90cm



+ 2 or more Items as below.

Abnormal Serum Lipid (Hyperlipidemia)

Triglyceride Value **≥150mg/dl**
and/or
HDL Cholesterol **<40mg/dl**

Hypertension

Systolic Blood Pressure **≥130mmHg**
and/or
Diastolic Blood Pressure **≥85mmHg**

Hyperglycemia

Fasting Plasma Glucose Level **≥110mg/dl**



Discovery of DHA & EPA



Myocardial Infarction occurs very little among Inuit.

① ②



Seal's Oil is **n-3 Unsaturated Fatty Acids Rich**, unlike the Cow and the Pig.



Tuna



Skipjack tuna

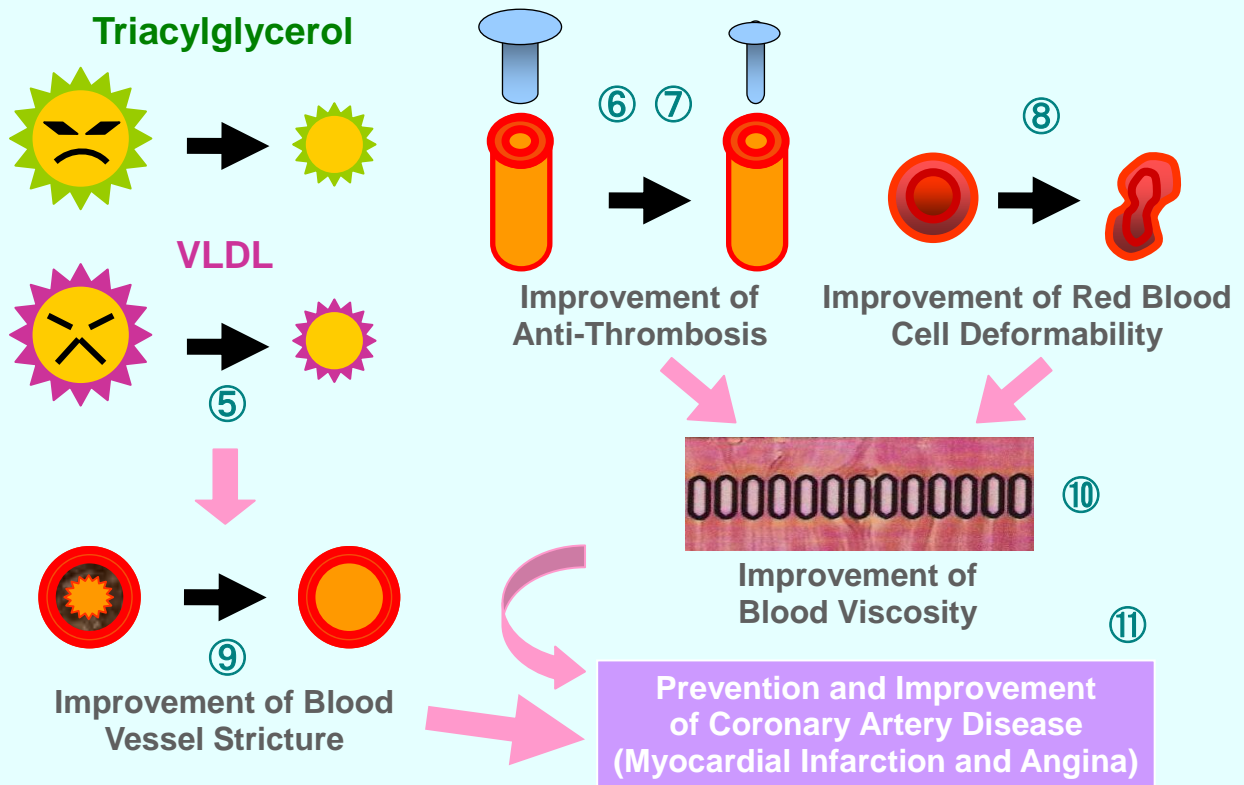


Pacific saury

n-3 Unsaturated Fatty Acids Rich

③ ④

Functions of DHA & EPA



1. Improvement of Blood Lipids
 - A) Reduction of Triacylglycerol
 - B) Decrease of VLDL
2. Anti-Thrombosis Activity
3. Improvement of Red Blood Cell Deformability
4. A Decrease in Body Weight ¹²

Prevention of Arteriosclerosis

References

1. Kromann N and Green A "Epidemiological studies in the Upernavik district, Greenland. Incidence of some chronic diseases 1950-1974." Acta Med Scand 208: 401-406 (1980)
2. Hiramitsu Suzuki, Syun Wada and Riyo Miura "Fishery Food and Nutrition", published by GIHODO, (2004)
3. Hiramitsu Suzuki "Sakana wo Taberu to Atama ga Yokunaru" (If it eats the fish, it becomes smart.), KK Best Sellers (2002)
4. Kazunaga Yazawa "Sakana ga Anata wo Suku" (The fish saves you.) HOKEN (1994)
5. "Prevention of Cardiovascular Diseases" edited by Japan Society for Lipid Nutrition, Academic Center, Kansai (2002)
6. Hiramitsu Suzuki "Health Function of Fish Oil", Japan Oil Chemist's Society, 48, 1017-1024 (1999)
7. Hiramitsu Suzuki, Syun Wada and Riyo Miura "Fishery Food and Nutrition" published by GIHODO (2004) p.122
8. Akira Kumagai "Medicine of EPA", Nakayama Syoten (1994)
9. Tatsuya TAGAWA, Yoshitaka HIROOKA, Hiroaki SHIMOKAWA, Kiyoshi HIRONAGA, Koji SAKAI, Jun-ichi OYAMA and Akira TAKESHITA: "Long-Term Treatment with Eicosapentaenoic Acid Improves Exercise-Induced Vasodilation in Patients with Coronary Artery Disease". Hypertens Res; Vol. 25: 823-829 (2002)
10. Akira Kumagai "Medicine of EPA", Nakayama Syoten (1994)
11. Liebich HM, Wirth C, Jakober B "Analysis of polyunsaturated fatty acids in blood serum after fish oil administration." : J Chromatogr. Dec 6;572(1-2):1-9 (1991)
12. Kriketos AD, Robertson RM, Sharp TA, Drougas H, Reed GW, Storlien LH, Hill JO "Role of weight loss and polyunsaturated fatty acids in improving metabolic fitness in moderately obese, moderately hypertensive subjects." J Hypertens. Oct;19(10):1745-54 (2001)

Purpose of the DHA & EPA Association

The Association comprises companies and organizations that have links with DHA and EPA.

The objectives of the Association are:

- to promote the manufacture and supply of high quality products,
- to offer PR services to consumers,
- to negotiate with relevant administrative bodies, and
- to develop the DHA and EPA industry as a whole by disseminating information about them and by encouraging demand for these products, which are essential for a healthier life.

Activities

The Association will engage in the following activities with a view to promoting the exchange of information, providing PR services to consumers, and dealing with associated problems, as required by its members and in accordance with the financial situation of the Association:

- (1) The interchange of members and the exchange of information,
- (2) The collection and distribution of academic information and of new findings, published both in Japan and elsewhere, concerning manufacturing technology and the physiological effects of DHA and EPA,
- (3) The organization of seminars and lecture meetings,
- (4) Dealings with administrative bodies,
- (5) PR towards consumers, and
- (6) Taking action to achieve the purposes of the Association.

Membership

The membership of the Association comprises:

- (1) Companies and organizations that are involved in the production and marketing of DHA and EPA, and which support the aims and objectives of the Association (Regular Members),
- (2) Companies and organizations other than the above, which support the aims and objectives of the Association (Supporting Members).

Membership is subject to payment of the membership fee.

Contact Information

DHA & EPA Association Secretariat

c/o Japan Marine Oil Association
32-7, Motoyoyogi-Cho, Shibuya-Ku,
Tokyo 151-0062 JAPAN

TEL & FAX: +81-3-3469-6931

URL: <http://www.dhaepa.org/> E-mail: dha_epa@par.odn.ne.jp