



College of Applied Medical Sciences
Department of Community Health
Sciences



Clinical Nutrition
Functional Foods
CHS 457
Level 9

FISH



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Outline:



- Introduction.
- The main key nutrient found in fish.
- Different types of oily fishes as a source of omega 3 FA.
- Healthiest cooking oil tips.
- General health benefits of consuming oily fishes high in omega 3 FA.
- The recommended amounts for the consumption of fish.
- The common side effects of fish oil supplements.
- The possible risks of eating fish.
- Some supporting studies on fish & fish oil consumption.
- Summary.
- References.



❖ Introduction:

Fish is a good source of protein and unlike fatty meat products which are high in saturated fat.

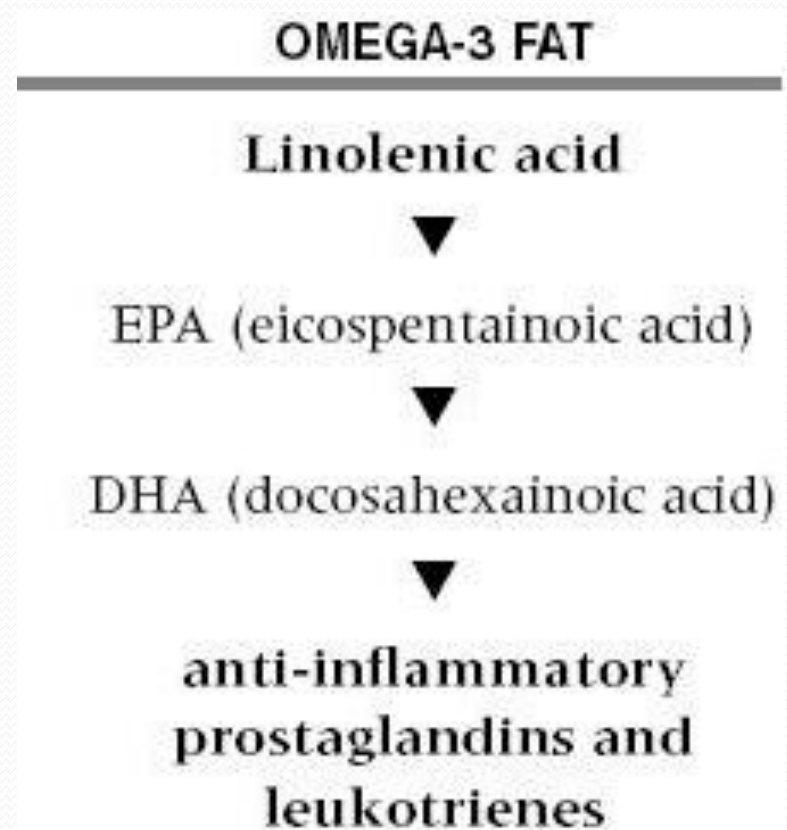
It is considered a main source of **omega 3 Fatty acid** called **linolenic acid** which is an essential fatty acid, they cannot be synthesized by the human body but are vital for normal metabolism. The benefits of consuming oily fish are highly varied.

Fish is also a source of the trace mineral “**Iodine**”, which is important for the thyroid gland function and the synthesis of the thyroid hormones. It's found in iodized salt, seafood and plant-based foods grown in soil that contains iodine.



❖ The Key nutrient Found in fish:

Omega 3 Fatty Acid (Linolenic acid)
(EPA, DHA) which are sources of
Omega 3 FA.

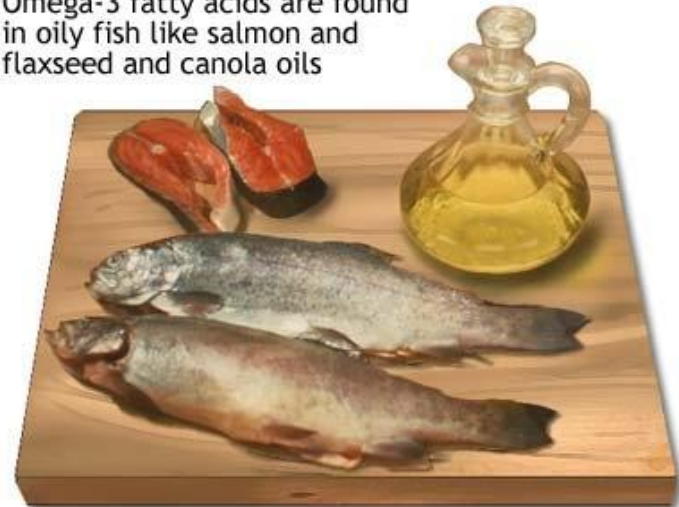


❖ Different types of oily fishes as Omega 3 FA source:

ALA* can be obtained from flaxseed (57%), canola (8%), and soybean (7%) oils and green leaves in a few plants such as purslane.

Sources of the longer EPA and DHA omega 3 FA are primarily found in: cod liver oil, mackerel, salmon, and sardines as well as crab, shrimp, and oysters.

Omega-3 fatty acids are found in oily fish like salmon and flaxseed and canola oils



*ALA= Alpha-linolenic acid

❖ Healthiest cooking oil tips:

- Oils with omega 3 FA are good sources for the healthy fats (polyunsaturated) e.g. flaxseed oil “rich source of omega 3 FA”.
- Oils with a higher Omega-3 fatty acids promote healthy cells and decrease stroke and heart attack risk. They are also known for their anti-inflammatory action.



- It is even better if the oil is loaded with antioxidants and vitamins.
- Knowing the smoke point of the oil is important because heating oil to the point where the oil begins to smoke produces toxic fumes and harmful free radicals.

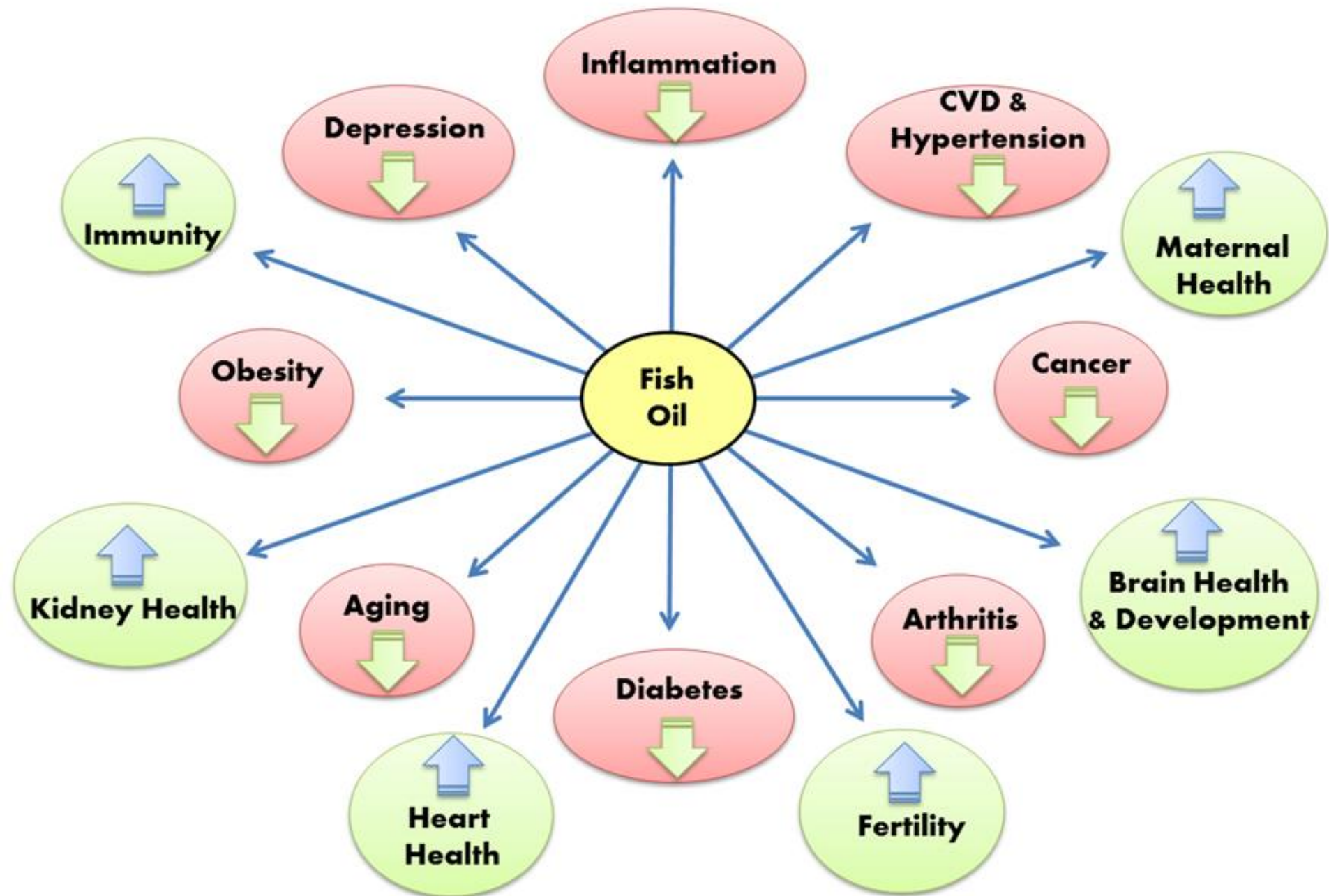
Cooking oil/fat	Smoke point (°C)	Smoke point (°F)	Omega 6: Omega 3 ratio
Un refined flaxseed oil	107 °C	225°F	1:4

❖ General health benefits of consuming oily fishes high in omega 3 FA:

There is supportive evidence from multiple studies that suggests the intake of recommended amounts of (DHA and EPA) omega 3 FA sources in the form of dietary fish or fish oil supplements.



Beneficial effects of EPA and DHA



❖ The recommended amounts for the consumption of fish:

Table

American Heart Association Recommendations for Omega-3 Fatty Acid Intake

Patient Population	Recommendation
Individuals without documented CHD	Eat a variety of (preferably fatty) fish at least 2 times per week. Include oils and foods rich in ALA (eg, flaxseed, canola, and soybean oils, and walnuts).
Patients with documented CHD	Consume approximately 1 g of EPA+DHA per day, preferably from fatty fish. EPA+DHA in capsule form could be considered in consultation with the physician.
Patients who need to lower triglycerides	2-4 g of EPA+DHA per day provided as capsules under a physician's care.

ALA = alpha-linolenic acid; CHD = coronary heart disease; DHA = docosahexaenoic acid; EPA = eicosapentaenoic acid.
Adapted from reference 1.

Cont..

WHO* and governmental health agencies of several countries recommend consuming **(0.3-0.5) gm of EPA+DHA** and **(0.8-1.1) gm of ALA** daily.



*WHO=World Health Organization.

❖ The common side effects of fish oil supplements:

- Fish oil supplements may cause nausea, diarrhea, loose stools, decreased appetite, constipation, vomiting, and fat in the stools (Steatorrhea).
- Gastrointestinal side effects may be minimized if fish oils supplements are taken with meals and if doses are started low and gradually increased.



❖ The possible risks of eating fish:

Some types of fish may contain high levels of mercury, and other environmental contaminants.

Levels of these substances are generally highest in older, larger, predatory fish and marine mammals (e.g. shark, king mackerel).

Eating a variety of fish will help minimize any potentially adverse effects due to environmental pollutants.





❖ Supporting studies on fish & fish oil consumption



Study #1 (Fish oil & Rheumatoid Arthritis)

This study was conducted on humans with RA* , it is a randomized controlled trail study.

Efficacy of Fish body oil in relieving clinical symptoms of RA has been tested in 12 RCTs** with sample size ranging from 16 to 68. All the trails were compared to a placebo.

In 11 trials it has been found that fish oil was **significantly more** effective than placebo in the treatment of RA. However, in one trial, effect of fish oil was similar to the effects of placebo.

*RA=Rheumatoid Arthritis.

**RCTs=Randomized Controlled Trails.



Study #2 (Cod liver oil , omega 3 FA & HTN*)

This study was done on 236 icelander subjects aged 65-91 years old from both genders 99 men (42%) and 137 women (58%) by using a three day food record.

Systolic blood pressure **correlated significantly and inversely** with intake of cod liver oil and long-chain omega-3 fatty acids, even when gender, age, BMI, and use of antihypertensive drugs were accounted for.

*HTN= Hypertension.



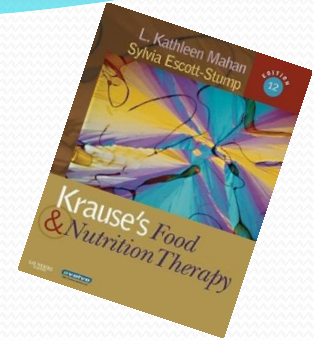
❖ Summary:

- As mentioned before omega 3 fatty Acid is found in oily fishes as salmon, sardines.
- The health benefits of omega 3 FA is widely varied: omega 3 FA can reduce triglycerides levels, atherosclerosis, blood pressure levels, important for a healthy heart, osteoporosis, rheumatoid arthritis in old people and can help in weight loss management.
- For preventing such diseases **“Don’t forget to consume oily fish twice/week!!”**

Thank you for listening



❖ References:



- ✓ Krause's Food & Nutrition Therapy.
- ✓ <http://www.nlm.nih.gov/medlineplus/druginfo/natural/993.html>
- ✓ http://www.mayoclinic.com/health/fish-oil/NS_patient-fishoil
- ✓ http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyDietGoals/Fish-and-Omega-3-Fatty-Acids_UCM_303248_Article.jsp
- ✓ <http://www.jonbarron.org/article/healthiest-cooking-oil-chart-smoke-points>
- ✓ Study #1 (Efficacy of fish body oil in the treatment of rheumatoid arthritis: a systematic review)
- ✓ Study #2 (Dietary habits and their association with blood pressure among elderly Icelandic people)
- ✓ <http://www.ncbi.nlm.nih.gov/pubmed/18602429>