



# Food Supplements in Cardiovascular Disease And Blood Pressure

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# **Omega-3 Polyunsaturated Fatty Acids and Cardiovascular Health**

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# Effect of Omega-3 Dosage on Cardiovascular Outcomes: An Updated Meta-Analysis and Meta-Regression of Interventional Trials

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Affiliations + expand

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**Free article**

EPA + DHA was associated with statistically significant lowered risk of CHD events and MI with equivalent risk reductions of 9% and 13%, respectively.

Importantly, this risk reduction was dose dependent for MI, as each additional 1g/day was associated with a significant risk reduction of 9%.

❖ Prolonged atrial refractoriness has been shown in humans with  $\Omega$ -3 supplementation (**6 g/day EPA + DHA for at least 1 month**) with **reduced vulnerability to induce atrial fibrillation**.

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❖ It is possible that higher doses, such as **6 g/day EPA + DHA**, may be needed for some **anti-arrhythmic effects**.

❖ **1 g/day  $\Omega$ -3 (EPA + DHA)** decreased the risk of death, non-fatal acute MI and stroke in patients with recent MI.



❖ Multiple trials continue to use an  $\Omega$ -3 intervention dose of **1 g/day of EPA + DHA**, which demonstrated **significant CVD benefits** in the landmark GISSI-P trial.

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❖ Patients in **Western nations or nations with lower  $\Omega$ -3 intake** in general may require higher-dose interventions (**2–4 g/day of EPA + DHA**) to reach a **therapeutic effect** of  $\Omega$ -3.

❖ Several decades and countless dollars have been spent studying the relationship between  $\Omega$ -3 and CVD without reaching a consensus among clinicians.

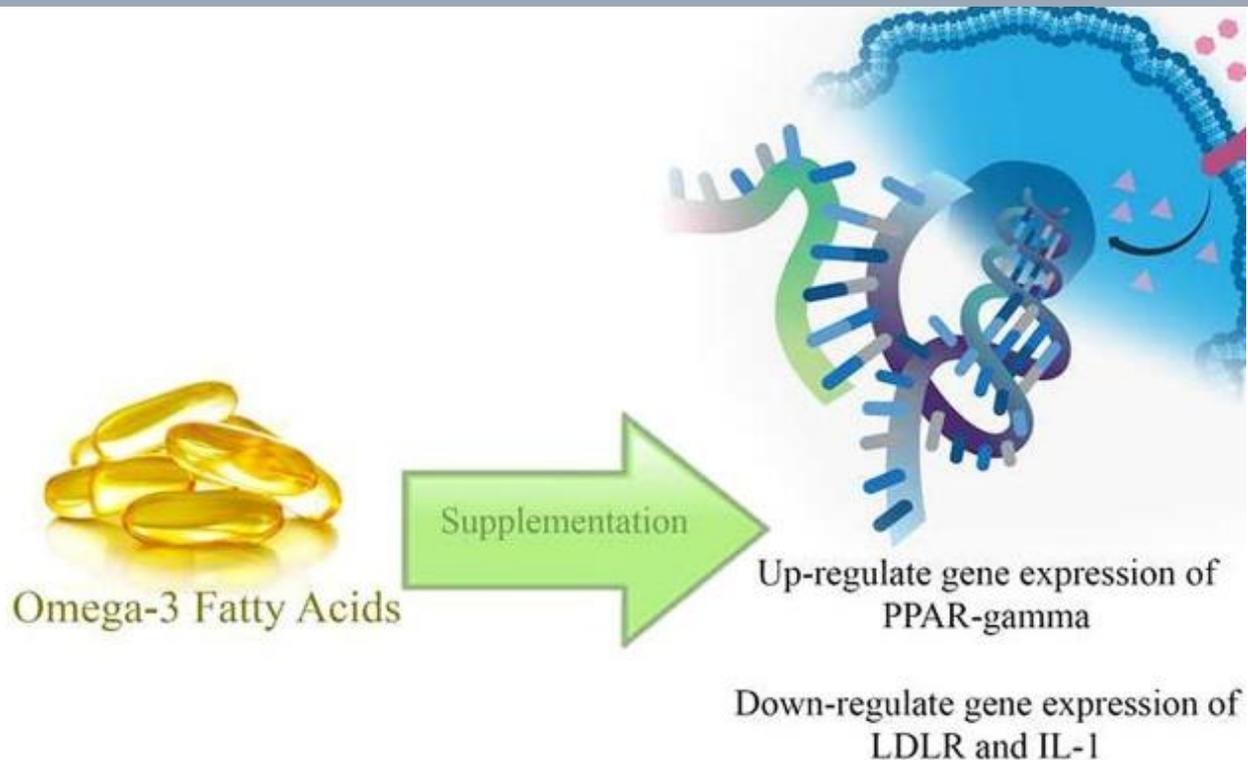
❖ There is, however, clear evidence from multiple studies that higher doses of  $\Omega$ -3 (2–4 g/day of EPA + DHA) appear to be safe and to reduce CVD events in multiple CVD populations.

# Molecular Mechanisms

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- **Anti-inflammatory effects**,  $\Omega$ -3 may reduce arrhythmias via direct **inhibition of sarcolemmal ion channels** which may stabilize electrical activity and prolong the relative refractory-
- $\Omega$ -3 also improve endothelial function by **increasing nitric oxide production** by directly stimulating endothelial nitric oxide synthase gene and protein expression.

*Omega-3 fatty acid oral intake is beneficial in regulating gene expression of cardiometabolic factors*



# Dietary Sources

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Fish oil is obtained in the human diet through seafood, specifically oily fish, such as [salmon](#), [sardines](#), [herring](#), [mackerel](#), [albacore tuna](#), and [trout](#), or  $\Omega$ -3 supplementation.  $\Omega$ -3 levels are naturally high in wild fish, whereas farm-raised fish tend to be grain fed and have resultant lower  $\Omega$ -3 levels.

Generally, [shark](#), [swordfish](#), [tilefish](#) and [king mackerel](#) contain high levels of mercury and frequent ingestion should be avoided.

Of note, mercury is water soluble and protein bound, and is therefore present in the muscle of fish but not as readily in the oil; as a result of this and high-quality manufacturing, fish oil supplements contain negligible amounts of mercury.

**Plant sources of  $\Omega$ -3**, primarily in the form of alpha-linolenic acid, include soybean, flaxseed, chia, hemp, linseed, rapeseed (canola oils) and tree nuts. Because plant  $\Omega$ -3 are converted to EPA and DHA in limited amounts, plant-based  $\Omega$ -3 should not be considered a replacement for preformed  $\Omega$ -3 EPA and DHA.

# Guidelines

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The current (2015–2020) dietary guidelines for Americans recommend consumption of approximately **8 ounces per week (2 servings per week)** of a variety of seafood for the general population, which would be expected to provide an average daily intake of approximately **250 mg of EPA and DHA**.

However, that amount will not increase the  $\Omega$ -3 index to a level  $> 8\%$ . A daily intake of between 1 and 2 g/day of  $\Omega$ -3 EPA + DHA is required to achieve an  $\Omega$ -3 index  $> 8\%$ .

The 2019 American College of Cardiology/AHA guidelines for the primary prevention of CVD offer a class I recommendation for a diet emphasizing the intake of vegetables, fruits, legumes, nuts, whole grains and fish to decrease CVD risk factors.

A 2018 science advisory from the AHA regarding  $\Omega$ -3 recommends consumption of non-fried seafood 1–2 times per week for CVD benefits, including reduced risk of CVD death, CHD, and ischemic stroke.



# Omega-3 Polyunsaturated Fatty Acids and Blood Pressure

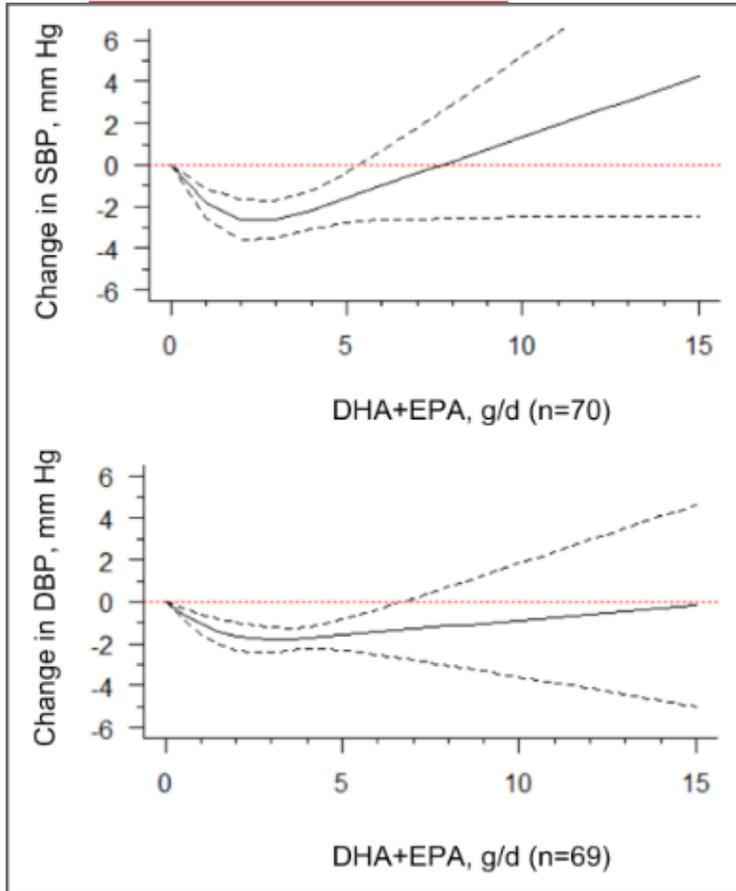


**SYSTEMATIC REVIEW AND META-ANALYSIS**

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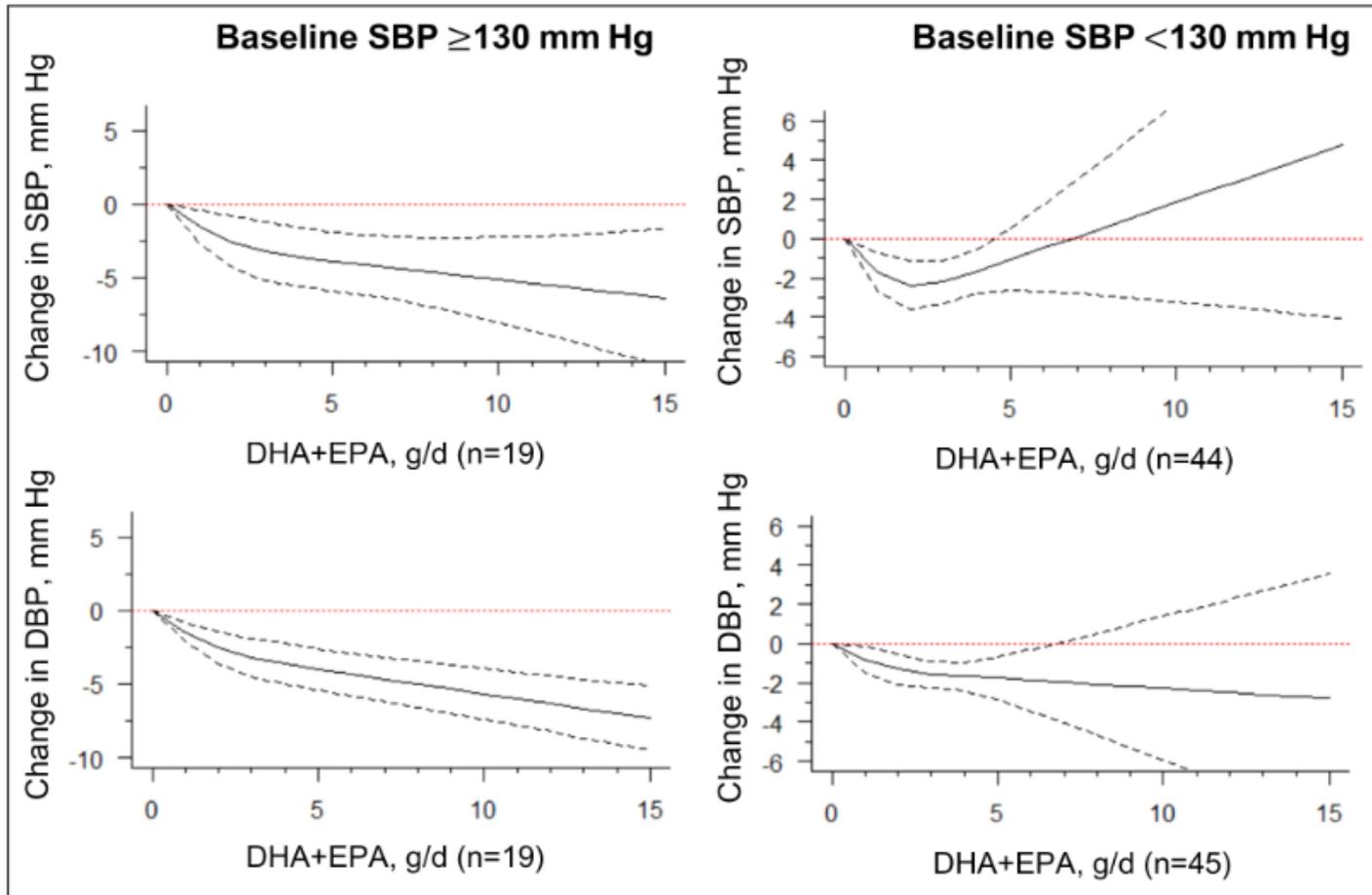
# Omega-3 Polyunsaturated Fatty Acids Intake and Blood Pressure: A Dose-Response Meta-Analysis of Randomized Controlled Trials

Xin Zhang, PhD<sup>\*</sup>; Jennifer A. Ritonja, PhD<sup>\*</sup>; Na Zhou, PhD; Bingshu E. Chen, PhD ; Xinzhi Li, MD, PhD 



The **J-shaped** curves suggest that dosages of DHA+EPA at **2 g/d to 3 g/d** are associated with the strongest changes in both SBP and DBP.

- ❖ average mean changes in **SBP** were **-2.61 mmHg** for 2 g/d of DHA+EPA, and **-2.61 mmHg** for 3 g/d of DHA+EPA.
- ❖ average mean changes in **DBP** were **-1.64 mmHg** for 2 g/d of DHA+EPA, and **-1.80 mmHg** for 3 g/d of DHA+EPA.



# JAHA

Journal of the American Heart Association

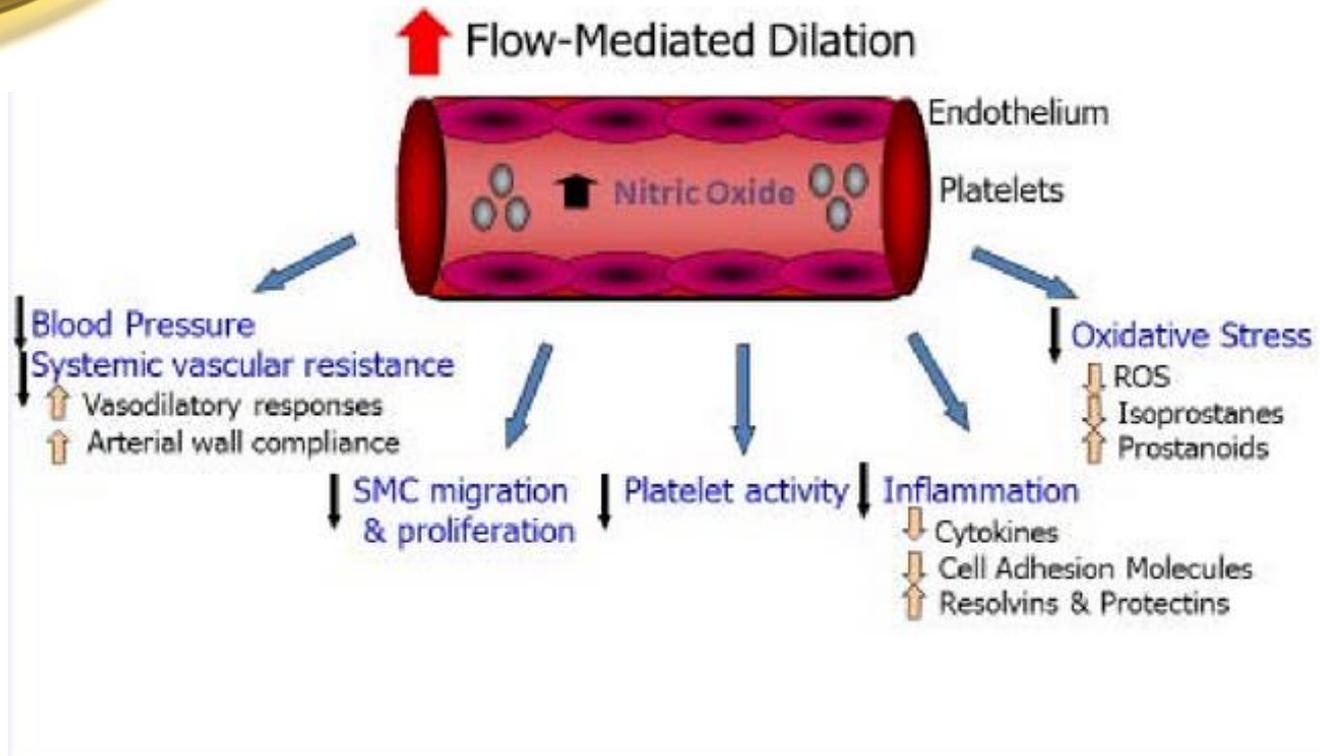
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This dose-response meta-analysis demonstrates that the optimal combined intake of omega-3 fatty acids for BP lowering is likely **between 2 g/d and 3 g/d DHA+EPA.**

Doses of omega- 3 fatty acid intake **above the recommended 3 g/d** may be associated with **additional benefits in lowering BP** among groups at high risk for cardiovascular diseases



## Omega-3 Fatty Acids



# The Problem with Fish Oil Capsules

- **Ineffective Omega 3 Doses**
- **Bioavailability Issues**
  - researchers have found that certain types of liquid medications can be 30 – 37% more bioavailable than the capsule equivalents.
- **Rancidity Problems**
  - omega-3 oils are highly susceptible to spoiling (or oxidizing) due to the fatty acids' many double bonds. Most fish oil supplements are rancid long before their stated expiration date.
  - Unfortunately, heat and oxygen exposure during the encapsulation process can contribute to turning fish oils rancid.
  - In addition, when fish oil is put into capsules, people no longer taste and smell what they are getting.

# Fish Oil Capsule Benefits

- Fish oil capsules are also easy to travel with, do not require refrigeration, avoid oily texture issues, and fit into many people's medication and supplement routines.
- According to the Healthy Hearts Club, the body can utilize 98 percent of liquid extract but only 39 to 53 percent of the nutrients from a capsule. The remainder is digested and discarded.

- **Risk Zones: The Omega-3 Index**
- High Risk =  $<4\%$
- Intermediate risk = 4-8%
- Low risk =  $>8\%$

## How EPA and DHA Measure Up

- The Omega-3 Index test is simply a measure of the amount of EPA and DHA in the blood, specifically the red blood cell membranes.
- For example, if you have 64 fatty acids in a cell membrane and 3 are EPA and DHA, then you would have an Omega-3 Index of 4.6%.
- When you take an Omega-3 Index test it gives you a percentage.
- Well, what does that mean exactly? An Omega-3 Index of 8% or higher is ideal, the lowest risk zone. However, most consumers hover around 6% or below.

<b>Product Type</b>	<b>Dose Per Unit</b>	<b>Servings Needed to Get 2000 - 3000 mg EPA/DHA</b>
Regular fish oil capsule	~ 300mg EPA/DHA	7 – 10 capsules
High concentrate fish oil capsule	~ 600mg EPA/DHA	3 – 5 capsules
Krill oil capsule	~ 75mg EPA/DHA	27 – 40 capsules
Teaspoon of cod liver oil	~ 1000mg EPA/DHA	2-3 teaspoons
Serving of wild salmon *	~ 2000 - 3000mg EPA/DHA	6 oz fillet



ترکیبات ( در هر 10 سی سی ) :

نیاز روزانه	مقدار	نام
*	4.52 g	روغن ماهی امگا 3
*	4.52 g	روغن کبد ماهی
*	968 mg	EPA
*	878 mg	DHA
% 25	200 mcg	Vitamin A
% 200	10 mcg	Vitamin D
% 110	11 mg	Vitamin E



ترکیبات ( در محصول ) :

نیاز روزانه	مقدار	نام
*	540 mg	روغن ماهی امگا 3
*	540 mg	روغن کبد ماهی
*	116 mg	EPA
*	106 mg	DHA
% 24	1.2 mcg	Vitamin D
% 110	11 mg	Vitamin E

## Omega-3 Fish Oil & Vitamin D3

**Ultra™ Omega-3** liquid contains a pure, pharma grade source of DHA (Docosahexaenoic acid) and EPA (Eicosapentaenoic acid), with vitamin D3, plus vitamin E which helps protect the natural oil.

### Nutritional Information

Nutrient	Av. per 5ml	% EC NRV*
Fish Oil	4.6 g	—
<i>Providing minimum:</i>		
Omega-3	1610 mg	—
As EPA (Eicosapentaenoic acid)	759 mg	—
As DHA (Docosahexaenoic acid)	483 mg	—
Vitamin D (as D3 500 IU)	12.5 µg	250
Vitamin E	6 mg α-TE	50

\*NRV = Nutrient Reference Value, g = gram  
µg = microgram, mg = milligram, IU = International Units

†A beneficial effect is obtained with a daily intake of 250mg of DHA.

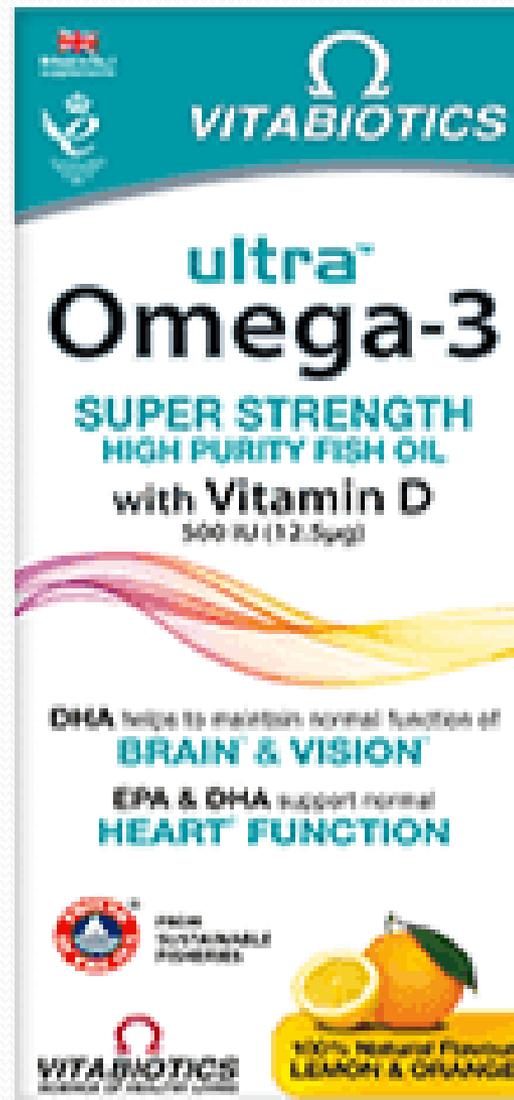
‡A beneficial effect is obtained with a daily intake of 250mg of EPA and DHA.

*Use within 3 months of opening. Keep out of sight and reach of children. Store at or below 25°C. Protect from sunlight and direct heat. Replace lid securely. See carton for full information.*

### DIRECTIONS

**Children 5-12 years: 2.5ml (½ teaspoonful) daily**  
**Adults: 5ml (1 teaspoonful) daily**

Can be taken on its own, followed by a sip of any drink or if preferred mixed with milk or orange juice.  
Do not exceed the recommended intake.



VITABIOTICS

100% Natural Flavour  
LEMON & ORANGE



**Marinox<sup>®</sup>**

# Omega 3

1000 mg Sea Fish Oil

Food Supplement  
with 35% Omega-3



60 Softgels

Made in Germany



Maintain wellbeing

igennus

HEALTHCARE NUTRITION

# Vegepa<sup>®</sup>

E-EPA 70

Maintains the omega-6 to omega-3 ratio

**MARINE ETHYL-EPA 70%**  
with plant GLA

- ✓ Source of beneficial fatty acids & phytonutrients
- ✓ Certified free from heavy metals, PCBs & dioxins
- ✓ Sustainable fish source

**60** **500 mg**  
easy-to-swallow capsules

514090 BBE 06 2016

هر کپسول حاوی  
 1000 ملگرم اسید ماهی  
 EPA 500 ملگرم  
 DHA 200 ملگرم  
 روزانہ ۳ کپسول  
 فائدہ جیوہ، طعم سرکبات  
 امگا - ۳



**High EPAQUATIC**  
**OMEGA-3**  **FISH OIL**  
 Mercury Free  
 Citrus Flavor  
**30 Softgels**

Each Capsule  
 1000 mg Fish Oil  
 500 mg EPA  
 200 mg DHA



## Supplement Facts

Serving size : 1 softgel  
Serving per container 30

	Amount Per Serving	%Daily Value*
Calories	9	
Calorie from Fat	9	
Total Fat (mg)	1000	1.5
<b>Total Omega 3 (mg)</b>	<b>700</b>	<b>†</b>
Omega 3 EPA (Eicosapentaenoic Acid)(mg)	500	†
Omega 3 DHA (Docosahexaenoic Acid) (mg)	200	†

\*Percent daily values are based on a 2000 calorie diet.  
†Daily value not established.

### INGREDIENTS

Fish Oil, Gelatin, Glycerin, Natural and Artificial Flavors.

### DIRECTION

As a dietary supplement take 1 to 3 capsules daily with meal or as directed by a healthcare practitioner.

### CAUTION

- Pregnant or nursing mothers and children under 18 should consult a physician/nutritionist before using this product.
- Combining certain prescription drugs and omega 3 may affect drug/supplement effectiveness. If you are taking any medication (blood thinning, blood pressure medications or nonsteroidal anti-inflammatory drugs such as; aspirin and ibuprofen) consult your healthcare practitioner before use.
- Store in a cool, dry place. Improper storage conditions, such as exposure to direct sunlight, high heat & humidity can cause product degradation over time. Do not use this product if the inner seal is broken or missing.

Produced by: Karen Pharma & Food Supplement Co.

[www.karenpharma.com](http://www.karenpharma.com)

Active ingredient supplied by BASF

ISO 9001:2015, ISO 22000:2018, ISO 14001:2015, HACCP, GC Mark



GC-MARK<sup>®</sup>  
PRODUCT QUALITY





# High DH/AQUATIC<sup>®</sup>

**OMEGA-3**  **FISH OIL**

Each Capsule  
1000 mg Fish Oil  
150 mg EPA  
500 mg DHA

Mercury Free  
Citrus Flavor

**30 softgels**

## Supplement Facts

Serving size : 1 softgel  
Serving per container 30

	Amount Per Serving	%Daily Value*
Calories	9	
Calorie from Fat	9	
Total Fat (mg)	1000	1.5
<b>Total Omega 3 (mg)</b>	<b>700</b>	<b>†</b>
Omega 3 EPA (Eicosapentaenoic Acid)(mg)	150	†
Omega 3 DHA (Docosahexaenoic Acid) (mg)	500	†

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# OMEGA-3

## GOLDEN SEAS®

Mercury Free - Citrus Flavor

FISH OIL



Each Serving

1200 mg Fish Oil

360 mg EPA

240 mg DHA

50 Capsules

## Nutrition Information

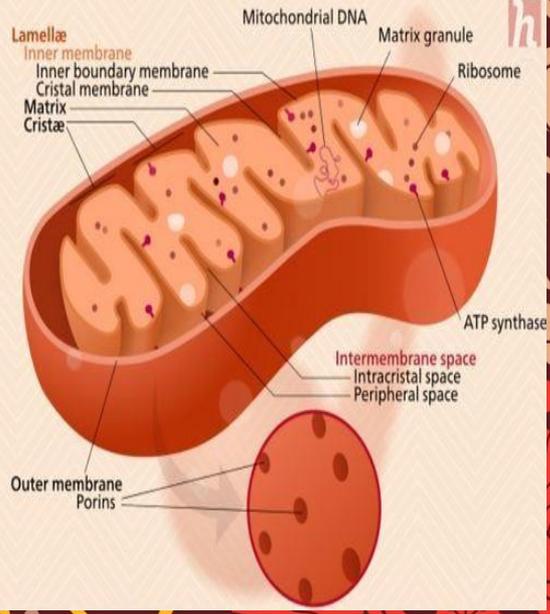
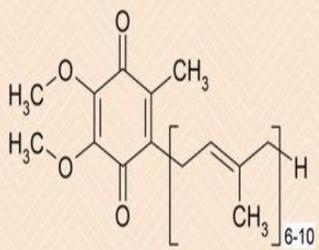
	pro 100ml	pro 10ml**	NRV*
Energy	1190kJ/285kcal	120kJ/29kcal	
Fat	21 g	2.1 g	
-of which saturates	6.1 g	0.6 g	
-of which mono-unsaturates	5.4 g	0.5 g	
-of which polyunsaturates	8.8 g	0.9 g	
-of which EPA	3.8 g	0.38 g	
-of which DHA	2.5 g	0.25 g	
Carbohydrate	30.0 g	3.0 g	
-of which sugars	<0.1 g	<0.01 g	
Protein	<0.1 g	<0.01 g	
Salt	<0.01 g	<0.01 g	
Vitamin E	60 mg	6 mg	50%
Vitamin A	2400 µg	240 µg	30%
Vitamin K	300 µg	30 µg	40%
Vitamin D	25 µg	2.5 µg	50%

\* NRV: Nutrient Reference Values based on Regulation (EU) 1169/2011

\*\* recommended for children older than 6 years and adults

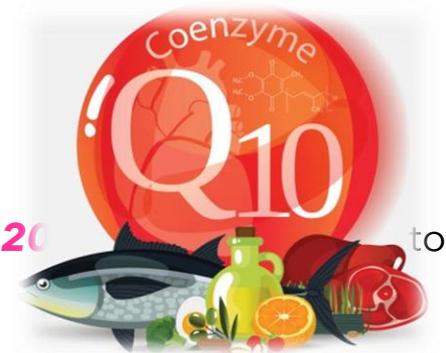


# Coenzyme Q10



# Needs

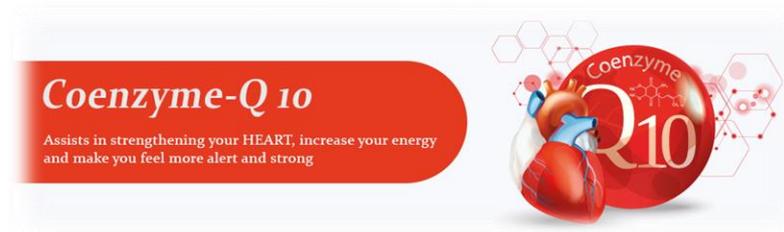
- ✓ Average daily nutritional intake : **3-5 mg/day**
- ✓ Nutritional sources : heart, chicken leg, herring, and trout
- ✓ **No DRI or RDA** have been established.
- ✓ Studies have mostly used doses of CoQ10 ranging from **50 - 120** to **3000** mg/day), and up to **10 mg/kg/day for children.**



# Effect of inflammation

In several inflammatory conditions plasma CoQ10 levels are **inversely associated** with inflammatory markers:

1. **Sepsis**
2. **Postcardiac arrest patients**



In a systematic review and meta-analysis, CoQ10 supplementation had a **significant lowering effect on inflammatory** markers including **CRP, IL-6 and TNF- $\alpha$**

# CoQ10 supplementation

CoQ10 as a supplement is available in single capsule doses of 30, 60, 100, 200, 300, 400, and 600 mg. Although there is no established minimum or maximum effective dose, the average dose necessary to attain a therapeutic blood level of  $> 2.5$  mcg/mL is 200 mg taken twice daily with a meal.

Though 90–200 mg of CoQ10 per day is typically recommended, needs can vary depending on the person and condition being treated.

## Use of coenzyme Q10 for prevention Statin muscle-related adverse events

For people taking statin medications, the typical dosage recommendation **for CoQ10 is 30-200 mg per day**

Some clinicians recommend that patients taking statins take Coenzyme Q10 (CoQ10) to try to prevent myopathy, and a few case reports have noted benefit with doses of **30 to 250 mg/day**. Further, a meta-analysis of several small clinical trials suggests benefit.

In one 2018 pilot study<sup>Trusted Source</sup>, ten children with cardiac muscle dysfunction received **110-700 mg of liquid ubiquinol per day**. At weeks 12 and 24 of treatment, the children had significantly higher CoQ10 plasma levels and improved heart function.

A study in 50 people taking statin medications found that a dose of **100 mg of CoQ10 per day** for 30 days effectively reduced statin-related muscle pain in 75% of patients.

## Selected Antihyperlipidemic Drugs

### *HMG Co-A Reductase Inhibitors*

- atorvastatin (Lipitor)
- simvastatin (Zocor)
- pravastatin (Pravachol)
- rosuvastatin (Crestor)

Drug may cause significant reduction in **CoQ<sub>10</sub>**. Drug lowers LDL cholesterol, raises HDL cholesterol.

Supplementation with **CoQ<sub>10</sub>** has not been shown to ↓ statin myopathy but may still be advisable for repletion of the nutrient. Encourage antiinflammatory diet for optimal drug effect.

Lipitor/Zocor: Avoid grapefruit/related citrus (limes, pomelo, Seville oranges).

Concurrent use of red yeast rice may increase risk of side effects.

# Drug interaction



- ✓ The most significant drug interaction occurs with **warfarin**
  1. CoQ10 shares some **structural similarity to vitamin K**
  2. may **increase the metabolism of warfarin** through **selective interaction** with **the cytochrome p450 enzymes**.
  - 3.
- ✓ This may be of concern in a population with **heart failure** where a significant proportion of patients have atrial fibrillation and may be anticoagulated
- ✓ However, a RCT showed CoQ10 supplementation at **100 mg/day had no effect on the clinical action of warfarin**
- ✓ Coenzyme Q10 should not be taken with gemfibrozil, tricyclic antidepressants

# Side Effects

- ✓ CoQ10 is generally well tolerated, even at extremely high doses of 1,000 mg per day or more.
- ✓ However, some people who are sensitive to the compound may experience side effects, such as heartburn, fatigue, light sensitivity, diarrhea, headache, nausea and skin rashes.
- ✓ It should be noted that taking CoQ10 close to bedtime may cause insomnia in some people, so it's best to take it in the morning or afternoon.

# Dietary Fiber

- ▶ High fiber intake has been associated with lower body mass index (BMI) and enhanced weight loss and weight maintenance.
- ▶ Fibers decrease the energy density of foods.

# Psyllium

- ▶ Psyllium, one of the water-soluble fibers, is derived from blonde psyllium seeds; it ferments slowly, helps build up fecal mass .
- ▶ Psyllium supplementation (up to 3.5 g per meal) may have significant beneficial effects on body composition changes in obese individuals, which include BMI and waist circumference, while causing minimal or no abdominal discomfort

# Psyllium

- ▶ It also reduces fasting glucose, total cholesterol levels, low-density lipoprotein (LDL) cholesterol, and triglycerides, while improving insulin sensitivity and increasing high density lipoprotein (HDL) cholesterol levels
- ▶ It may be ideal for an overweight person with metabolic syndrome

# Psyllium

- ▶ psyllium supplementation at doses **higher** than 3.5 g per meal does not have these effects on body composition in obese individuals.
- ▶ Higher doses of psyllium and overall fiber intake per meal (>3.5 g per meal) are associated with significant **abdominal discomfort**



# Konjac Root

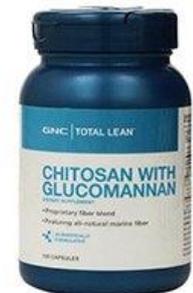
- ▶ Konjac, a plant found in Asia, especially India, Japan, and Korea, has been used in Asian cuisine
- ▶ Konjac flour is used as a food stabilizer, gelling agent, and supplement.
- ▶ It is the root, which contains a highly soluble fiber called glucomannan, which studies have shown may enhance weight loss and improve lipid profiles



- ▶ 2–4 g of glucomannan daily was well tolerated and led to improved blood lipid profiles.
- ▶ There is some evidence that glucomannan exerts its beneficial effects by promoting **satiety**, **lowering energy density**, **delaying gastric emptying**, and **reducing fat absorption in the intestines**, which may lead to more fecal energy loss.

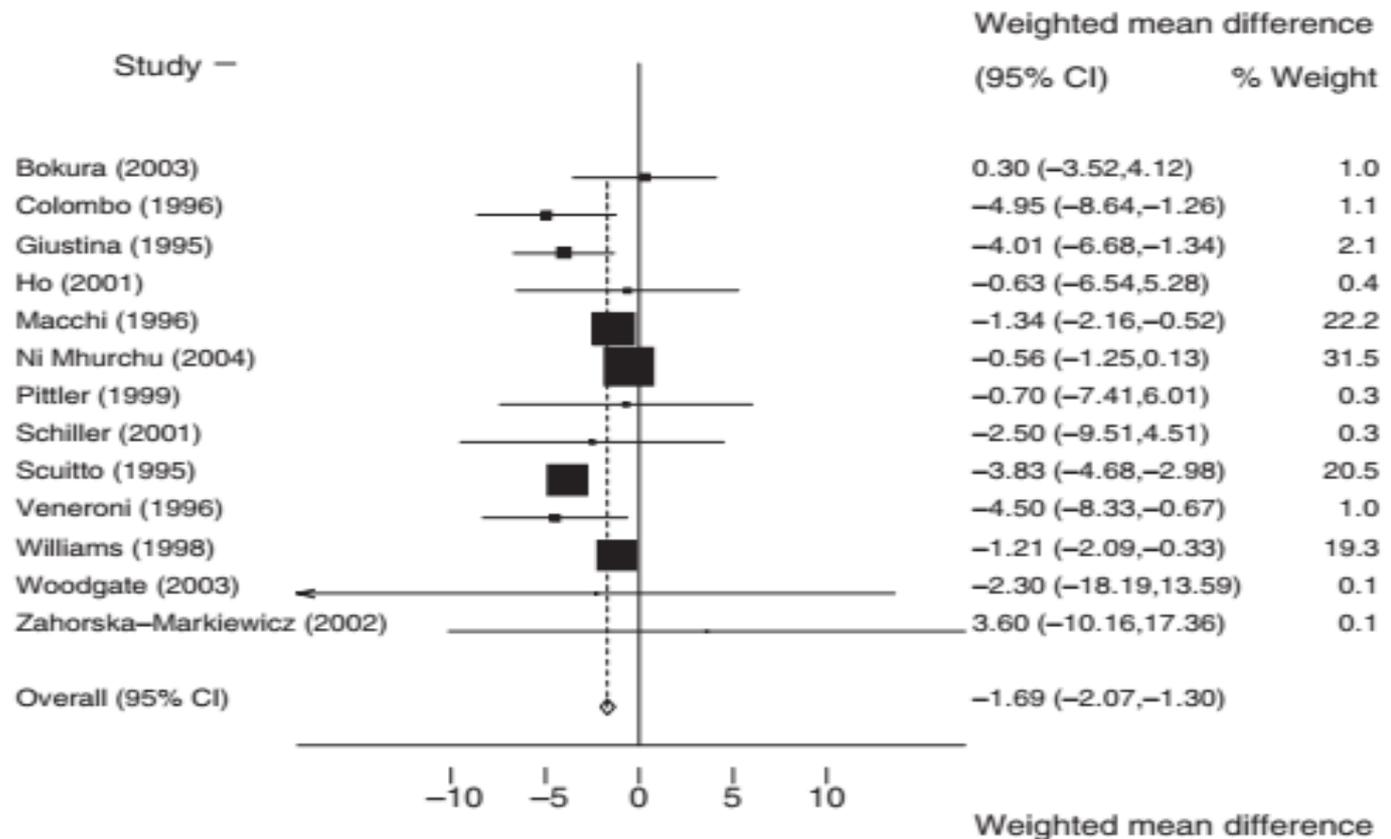
# Chitin

- ▶ Chitin is component of crab, shrimp, and lobster shells and thus abundantly available in nature.
- ▶ Like dietary fiber, chitin is a polysaccharide that is indigestible by the human gut.
- ▶ Chitosan is deacetylated chitin. In rats, chitosan has been shown to decrease hepatic cholesterol and increase bile acid and fat excretion



- ▶ There are not sufficient human studies to prove a beneficial effect of chitosan for weight loss.
  
- ▶ One meta analysis reviewed 14 studies that tested the effect of chitosan on weight loss and concluded that it causes a small net effect of approximately 1.7 kg .

# Analysis of change in body weight – all trials



# *Green Tea*



## *Green Tea*

- ▶ The main active polyphenolic compounds found in green tea preparations are (–)-catechin gallate (CG), (–)-gallocatechin gallate (GCG), (–)-epicatechin gallate (ECG), and (–)-epigallocatechin gallate (EGCG); caffeine; proanthocyanidins; and flavonols (myricetin, caempferol, quercetin)

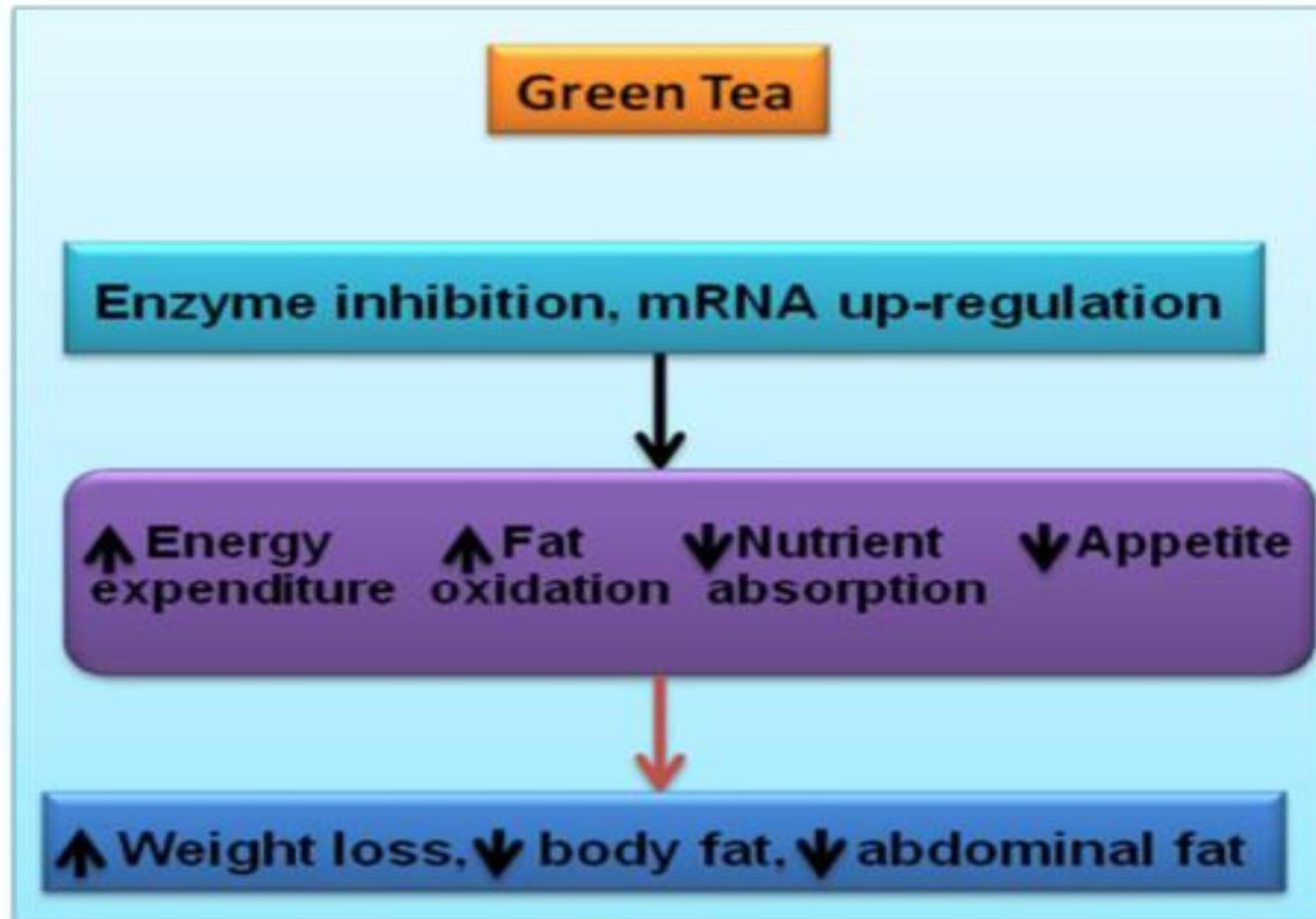
## *Green Tea*

- ▶ The results related to weight control benefits are more mixed, although multiple studies have shown that catechin-rich (>500 mg/d) green tea significantly reduces body weight and fat.
- ▶ **several possible mechanisms: increase in energy expenditure, fat oxidation, and suppression of the lipogenic enzyme fatty acid synthetase, thereby inhibiting lipogenesis.**

## *Green Tea*

- ▶ One study suggested that low habitual intake of catechin from green tea and caffeine together (270 mg green tea catechin and 150 mg caffeine per day) may assist in weight maintenance after weight loss.

# Proposed anti-obesity mechanisms of green tea



## Results of meta -analysis

- ▶ Green tea preparations appear to induce a small, statistically **non-significant** weight loss in overweight or obese adults.
- ▶ Because the amount of weight loss is small, **it is not likely to be clinically important.**
- ▶ Green tea had no significant effect on the maintenance of weight loss. Of those studies recording information on adverse events, only two identified an adverse event requiring hospitalization. The remaining adverse events were judged to be mild to moderate.

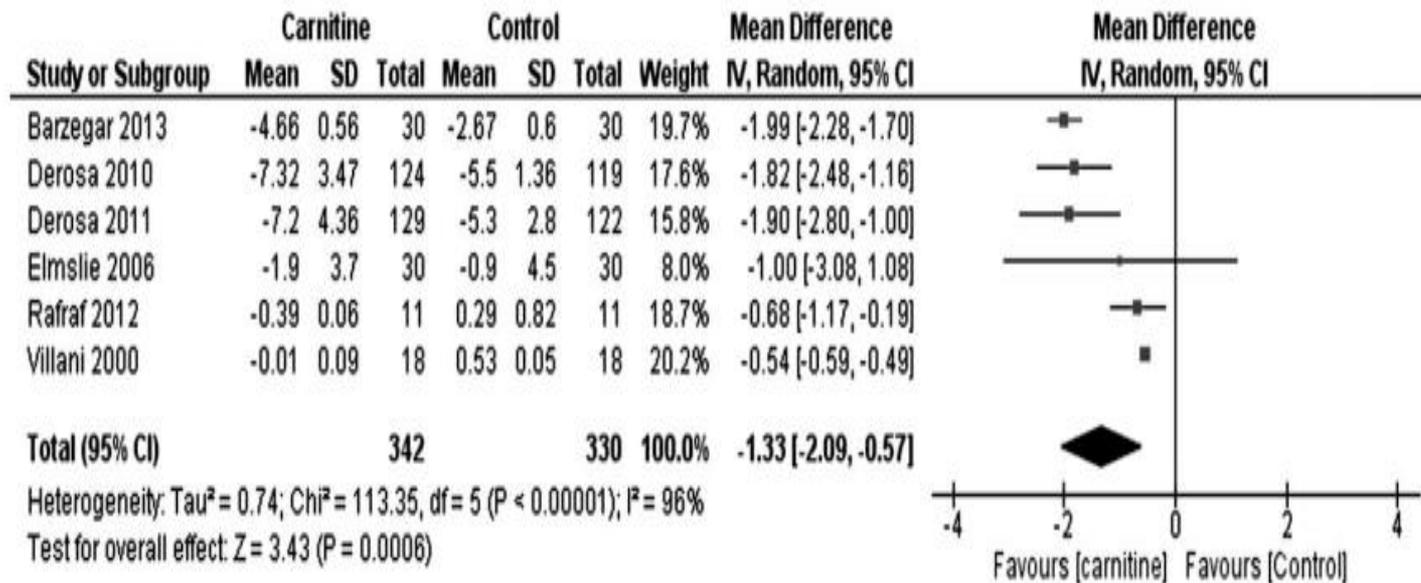
# L-Carnitine



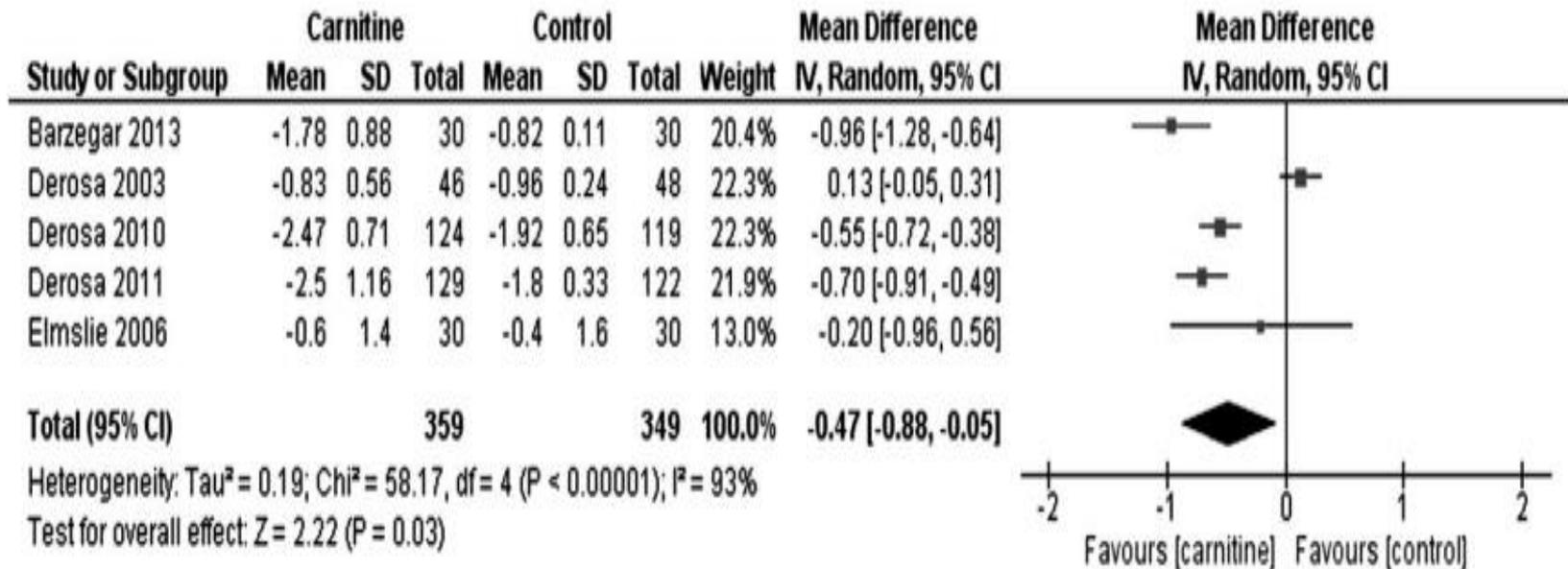
# L-Carnitine

- ▶ In normal healthy adults, L-carnitine supplementation (1 g/3 times a day) has shown to significantly increase fatty acid oxidation, suggesting it may help in weight loss

# Forest plot of weight change outcome after L-carnitine intake



## Forest plot of body mass index (BMI) change outcome after L-carnitine intake



# L-Carnitine

- ▶ Results of meta-analysis have shown that receiving the carnitine **resulted in weight loss**
- ▶ Effective dose: **2 to 3 gram/day**
- ▶ There is no evidence of any adverse effects of L-carnitine supplementation

# Risks of Side Effects

- ▶ L-carnitine products are considered safe for most individuals to take. Using this supplement in excessive dosages could lead to adverse effects
- ▶ If taken for weight loss, the suggested dosage is between 1,000 mg to 5,000 mg. The recommended dosage that individuals should take for weight loss varies based on age, health and other factors.

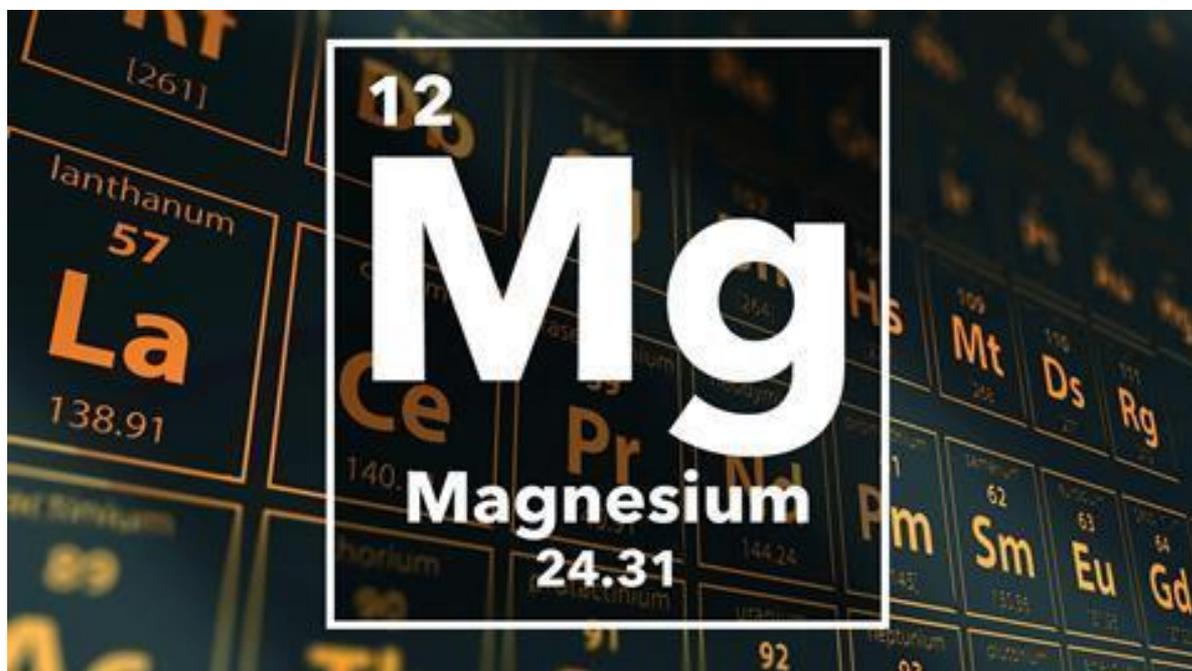
## Risks of Side Effects

- ▶ Diarrhea
- ▶ Skin rash
- ▶ Fish-like body odor
- ▶ Increased appetite

# L-Carnitine

- ▶ Those who take certain medications, such as blood thinners, thyroid hormones, valproic acid and doxorubicin
- ▶ Pregnant women should not take this supplement due to a lack of evidence on the safety of these supplements for women in this condition. These supplements are possibly safe for lactating women
- ▶ Some of the conditions that might be affected by use of this supplement include high blood pressure, diabetes, cirrhosis, kidney disease, peripheral vascular disease and seizures

# Magnesium



# عملکردهای منیزیوم

- کمک به درمان استرس و اضطراب

- موثر در حفظ سلامت و دستگاه قلبی-عروقی و تنظیم فشار خون

- Magnesium is relatively well absorbed by the gut; oral bioavailability varies from **35 to 70%** and depends on a variety of factors such as the form of the magnesium salt .
- **What blocks magnesium absorption?**
- Phytates in the diet bind to magnesium and impair its absorption.
- However the quantities present in normal diet do not affect magnesium absorption.
- Other dietary factors that are thought to affect magnesium absorption are **oxalate, phosphate, proteins, potassium and zinc.**

- sugar and caffeine — **deplete the body's magnesium levels.**
- Mg is essential in the metabolism of vitamin D, and **taking large doses of vitamin D can induce severe depletion of Mg.**
- Adequate magnesium supplementation should be considered as an important aspect of vitamin D therapy.

# What is the strongest natural muscle relaxer?

- **1. Chamomile**
- Chamomile is an ancient herb that's used to treat a variety of ailments, including muscle spasms.
- It contains 36 flavonoids, which are compounds that have anti-inflammatory properties.



نیاز روزانه	مقدار	نام
*	150 mg	Magnesium Marine
*	99 mg	Vitamin B1
*	20 mg	Vitamin B6
*	400 IU	Natural Vit D3
*	50 ug	Vitamin K2



نیاز روزانه	مقدار	نام
% 125	500 mg	Magnesium

# Biolectra®

MAGNESIUM 300mg

Direct

By using state-of-the-art manufacturing procedures Hermes has been able to develop a special dosage form. The micro pellets dissolve in the mouth and can be easily swallowed without liquid.

Instructions for use: Take the content of one stick 1x daily. Pour the micro pellets directly onto the tongue, allow them slowly to dissolve and then swallow. Please tear open the stick in the direction of the arrow.

Important notes: Food supplements should not be used as a substitute for a varied and balanced diet and a healthy lifestyle. The recommended daily dose should not be exceeded. Please store dry and at room temperature outside of the reach of young children. Contains a source of phenylalanine. Excessive consumption may produce laxative effects. Food supplement with sweeteners and lemon flavour. Granules with magnesium.

Nutritional information	per stick	% of daily reference intakes*
Magnesium	300mg	80%

\*according to current EU-Regulation

Contents: 20 sticks = 20 g  
Best before end: See bottom  
Only available in pharmacies!

HERMES ARZNEIMITTEL GMBH

Georg-Kalb-Straße 5-8 • 82049 Großhesselohe / Munich • Germany

# بیولکترا®

منیزیم ۳۰۰ میلی گرم

دیرکت

با استفاده از پیشرفته ترین روش های تولید، هرمس قادر به ساخت یک شکل دارویی خاص گردیده است. میکروپلتها به آسانی در دهان حل شده و می توان بدون نوشیدن مایعات آن را بلعید.

نحوه مصرف: محتوی یک ساشه را روزانه یکبار به طور کامل مصرف کنید. میکروپلتها را مستقیم روی زبانتان بریزید، اجازه دهید به آرامی حل شوند و آنها را بلعید. لطفاً ساشه را در جهت پیکان باز کنید.

نکات مهم: مکمل های غذایی نباید به عنوان جایگزین یک رژیم غذایی سالم، متعادل و متنوع استفاده شوند. بیشتر از مقدار توصیه شده در روز مصرف نشود.

لطفاً در جای خشک و در دمای اتاق، دور از دید و دسترس کودکان نگهداری شود.

حاوی فنیل آلانین می باشد. این محصول لگر در مقادیر زیاد استفاده شود می تواند اثر ملین داشته باشد.

مکمل غذایی حاوی شیرین کننده با طعم لیمو. گرانول های حاوی منیزیم.

این فرآورده صرفاً یک مکمل رژیمی - غذایی بوده و برای تشخیص، پیشگیری یا درمان بیماری نمی باشد.

در دوران بارداری و شیردهی تحت نظر پزشک مصرف شود. نماینده انحصاری در ایران: شرکت بهستان بهداشت

شرکت هرمس - آلمان

محتویات: ۲۰ ساشه = ۲۰ گرم

# Biolectra®

MAGNESIUM 300mg

Direct

For a normal muscle function

Food supplement

20 sticks

HERMES

Biolectra®  
MAGNESIUM Direct  
300 mg magnesium per sachet

- در ساخت این محصول فناوری توپوگرانولاسیون (تولید در خلا) به کار می‌رود. گلبول‌های کوچک که میکروپلت نامیده می‌شود این امکان را فراهم می‌آورند که منیزیم را بدون نیاز به آب مصرف نماییم.

- به عبارت بهتر محصول را مستقیم داخل دهان ریخته و در ظرف چند ثانیه منیزیم موجود آزاد می‌شود. طعم این محصول لیمویی است و هر ساشه حاوی ۳۰۰ میلی گرم منیزیم هیدروکساید است.

مکمل تغذیه ای / Food Supplement

لرکیبات فرآورده / Product Facts

Serving Size: 1 Sachet (1g)		محتوی یک بسته : ۱ گرم	
Amount Per Serving	%RDA	مواد سازنده به ازای ۱ بسته	
Magnesium Oxide equivalent to Magnesium	300 mg NA	اکسید منیزیم معادل منیزیم	۳۰۰ میلی گرم

%RDA - Recommended Daily Allowance.

**Other Ingredients:**

Sodium citrate, Citric acid, Aspartame, Saccharin, Sorbitol, Magnesium stearate.

**سایر ترکیبات:**

سدیم سیترات، اسید سیتریک، آسپارتم، ساکارین، سوربیتول، منیزیم استئارات.

**Flavour:** Orange.

**طعم:** پرتقالی.

**Recommended Daily Dosage:** 1 sachet daily.

**مقدار مصرفی روزانه توصیه شده:** روزانه ۱ بسته

**Direction for use:**

Orodispersible powder. No water required. Can be taken with or without food or as directed by the physician.

**دستور مصرف:**

بودر خوراکی بدون نیاز به آب. همراه با غذا و با بدون غذا و یا مطابق تجویز پزشک مصرف شود.

**Storage Instructions:**

Store below 30°C. Protect from light & moisture. Keep out of reach of children.

**شرایط نگهداری:**

در دمای کمتر از ۳۰ درجه سانتی گراد، دور از نور و رطوبت نگهداری شود.

دور از دسترس کودکان قرار گیرد.

این فرآورده جهت پیشگیری، تشخیص و درمان بیماری نمی باشد.





## مکمل غذایی حاوی منیزیم بیومگنلیت®

۳۰۰ میلی گرم منیزیم (سیترات)

تأمین ذخایر منیزیم در افراد مبتلا به:  
خستگی و انرژی پایین، بی خوابی، اسپاسم و گرفتگی عضلات، سردردهای  
میگرنی، اضطراب و عضلانیته، آسم، دیابت، درد و عوارض پیش از قاعدگی،  
پوکی استخوان، سندرم پای بیقرار، افزایش فشار خون، کرامپ‌های عضلانی  
دوران بارداری.



۲۰ ساشه



ساج پاد دارو

Type of magnesium	% of elemental magnesium	Bioavailability
Oxide	60	4
Carbonate	45	30
Hydroxide	42	10
Citrate	16	90
Glycinate	18	80
Malate	6.5	70

# Chitosan

- واقع یک ترکیب آمینو پلی ساکارید است که در پوست سخت پوستان یافت می‌شود و از پوست سخت پوستانی مانند خرچنگ و میگو استخراج می‌شود، کیتوزان قابل هضم نیست و بدون تغییر از مدفوع دفع می‌شود.
- کیتوزان همچنین بر فعالیت باکتری‌های مفید موجود در روده تأثیر مثبت دارد.
- کیتوزان دارای بار مثبت یونی است و با اسیدهای صفراوی باند شده در نتیجه سطح کلسترول را کاهش می‌دهد.
- کیتوزان مانند اورلیستات از طریق ممانعت از جذب چربی‌ها و دفع آن‌ها سبب کاهش وزن می‌شود. این قرص بر روی متابولیسم بدن تأثیر گذاشته و با پایین آوردن کلسترول خون می‌تواند در سلامت قلب و عروق مؤثر باشد.

- در حال حاضر آزمایشات کمی در مورد تأثیر این ماده بر روی انسان انجام شده است اما تحقیقاتی که در مورد حیوانات انجام شده نشان می‌دهد که استفاده از این ماده غذایی می‌تواند موجب جلوگیری از جذب مواد معدنی شود.
- همچنین از آنجایی که استفاده از این ماده غذایی از جذب چربی‌ها جلوگیری می‌کند لذا مصرف قرص‌های حاوی کیتوسان می‌تواند در دراز مدت موجب کاهش میزان ذخیره و یا کمبود ویتامین‌های محلول در چربی شود.
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- مطالعات نشان می‌دهند که مصرف خوراکی کیتوزان به مدت ۱۲ هفته باعث کاهش میزان ( **indoxyl sulfate** ) سم اورمیک که در سرم بیماران مبتلا به بیماری مزمن کلیوی یا CKD افزایش پیدا می‌کند) و سطوح فسفات در بیماران مبتلا به CKD می‌شود.



## ● نحوه مصرف

- ۱ الی ۳ کیپسول بلافاصله قبل از دو وعده اصلی غذا.
- از مصرف بیش از ۶ عدد کیپسول در روز خودداری نمایید.
- ایجاد اختلال و جلوگیری از جذب ویتامین‌های محلول در چربی و سایر داروها تا ۴ ساعت قبل و بعد از مصرف این فرآورده امکان پذیر است.