December 12, 2013

Dear Edward,

Congratulations on completing The Vital Omega-3 and 6 HUFA Test™ – the easy, evidence-based way to measure and manage the levels of omega-3 and omega-6 fatty acids in your blood.

There may be no simpler, safer, or more cost-effective path to disease prevention than to adjust your diet to achieve healthful blood levels and proportions of these vital nutrients.

We hope you will use the test results on the following pages - and our explanations of their meaning - to plan and achieve a healthier diet that reduces your risk of ill health.

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Introduction: Why Your "Omega Balance" Matters

The acronym "HUFA" stands for Highly Unsaturated Fatty Acids, which are essential food factors that we convert into hormone-like agents that influence inflammation and much more, and have receptors on nearly every cell in the body.

A substantial body of scientific evidence indicates that maintaining a healthful dietary balance of omega-3 and omega-6 HUFA can help you reduce your risk of heart disease and other common, chronic, physical and mental health problems*.

Humans evolved in adaptation to hunter-gatherer diets that contained a roughly equal balance of omega-3s and omega-6s. But modern diets contain much higher proportions of omega-6s, from common vegetable oils (e.g., corn, soy, cottonseed) and the processed foods made with them, as well as from seeds, nuts, grains, and grain-fed meats and poultry.

This historically unprecedented "omega imbalance" matters, for the following reasons (Lands WE 1992):

- Chronic, low-level inflammation promotes cardiovascular disease and many other degenerative conditions.
- Inflammation is controlled in large part by hormone-like substances called prostaglandins, which arise from the omega-3 (DHA and EPA) and omega-6 (AA) fatty acids in our cell membranes.
- Omega-3s in our cells (DHA and EPA) mostly yield prostaglandins that tend to moderate inflammation.
- Omega-6s in our cells (AA) mostly yield prostaglandins that tend to promote and maintain inflammation.
- Omega-6s compete with omega-3s for absorption into our cells and the hypothesis that excess intake of omega-6s drives many major diseases rests on persuasive evidence.

Most of us need to increase our intake of omega-3s while reducing our intake of omega-6s. Or, as leading fatty acid researcher William E. Lands, Ph.D., says, "Eat the threes and nix the sixes!" To learn why his views carry special weight, read "About William E. Lands, Ph.D." on page 9.

*The FDA has not evaluated this statement. This product is not intended to diagnose, treat, or cure any disease. *The Vital Choice Omega 3 and 6 HUFA Test*™ provides you with information to help you make dietary choices that may lower your risk of disease. Please note that you should never change any prescribed drug regimen without consulting your doctor.

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Your Vital Omega Test Scores

The following five charts show your key test results:

1. Vital O-Mega Scores™ – Your heart risk, based on your percents of omega-3 and omega-6 in HUFA.
2. Percent Omega-3 in HUFA – Your personal score, the optimal score, and the U.S. average.
3. Omega-3s and Risk of Heart Death – One basis of your Vital O-Mega Scores™.
4. Percent Omega-6 in HUFA – Your personal score, the optimal score, and the U.S. average.
5. Omega-6s and Risk of Heart Death – Another basis of your Vital O-Mega Scores™.

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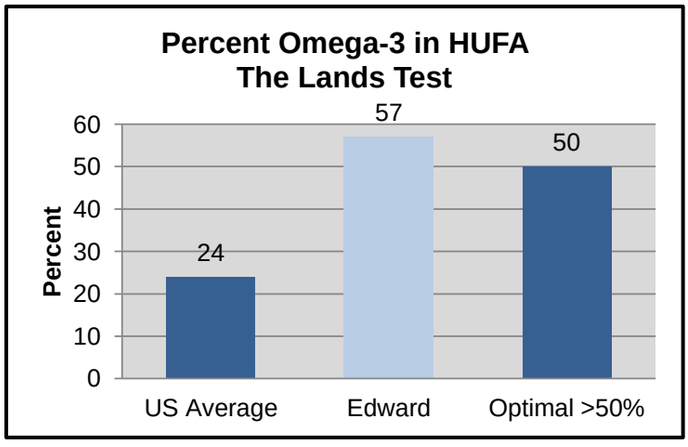
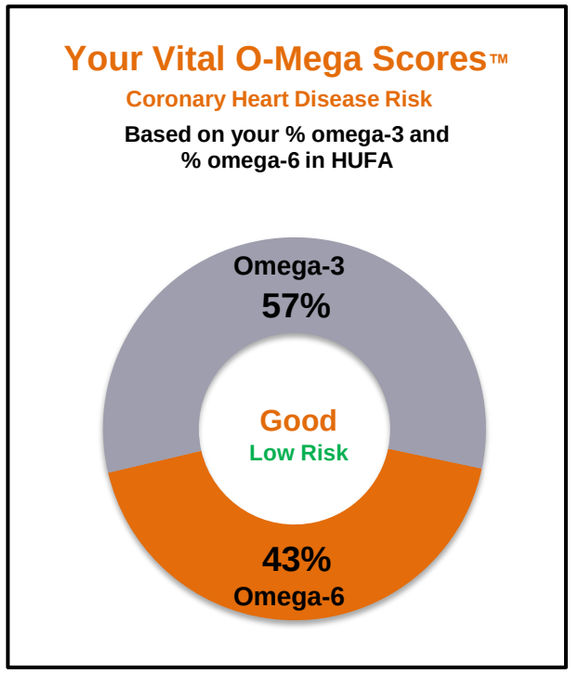
1. Your Vital O-Mega Scores™ – Ranking your heart risk
This graphic reveals your Percent Omega-3 in HUFA, your Percent Omega-6 in HUFA, and your estimated heart risk based on those test results.

2. Your Percent Omega-3 in HUFA Score
This score reveals the percent of your blood HUFA that's made up of omega-3 HUFA, including EPA, DPA, and DHA. For example, if your score is 25%, then omega-3s make up 25% of the total amount of highly unsaturated fatty acids (HUFA) in your blood. You can see that the average American has a score of 24%. For optimal heart and overall health, your Percent Omega-3 in HUFA Score should be at least 50%.



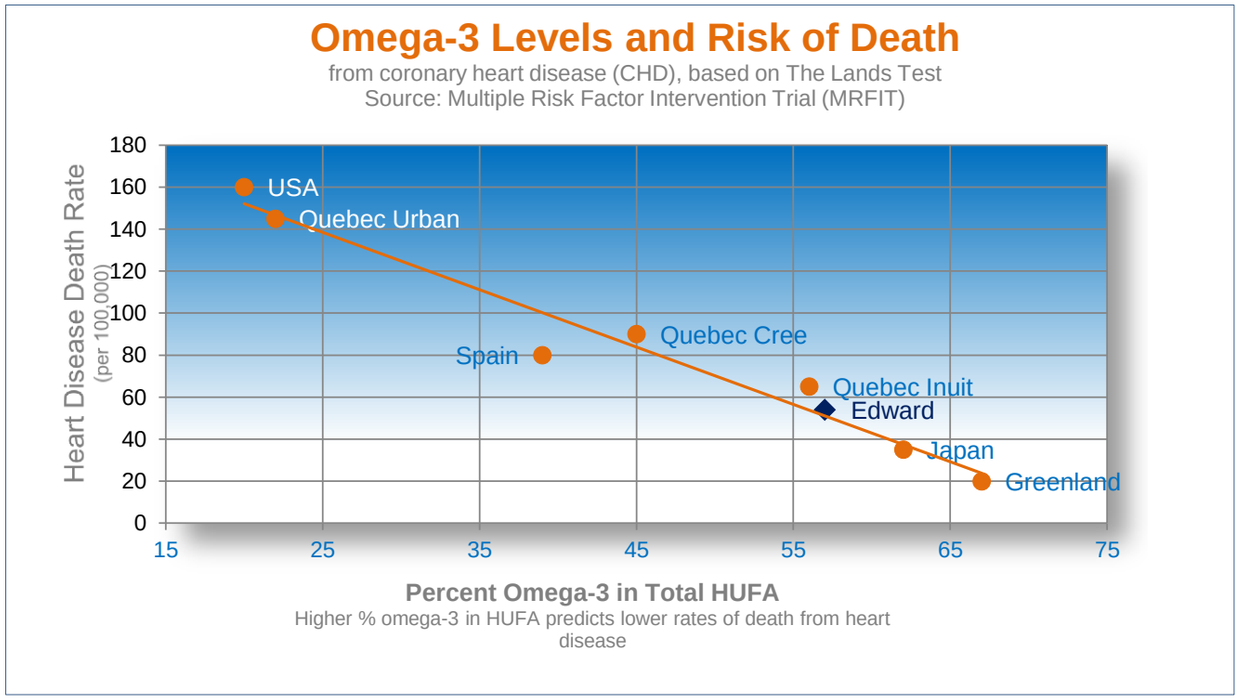


% Omega-3	Status	CHD Risk
>60%	Excellent	Lowest
45--59%	Good	Low
35--44%	Fair	Reduced
25--34%	Poor	High
<25%	Poorest	Highest

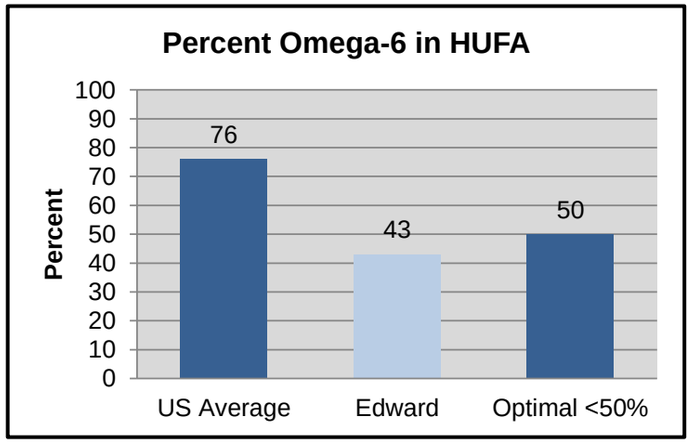
Note: The risk classifications are general guidelines based upon analysis of data collected in the Multiple Risk Factor Intervention Trial (MRFIT), which revealed the risk of coronary heart disease in relation to the balance of omega-3 and omega-6 HUFA in human blood. The two charts presenting these analyses are shown on pages 3 and 4. Overall risk of CHD will vary among inidividuals, according to their status with regard to other risk factors such as diet, activity, weight, and genetics.

3. Omega-3 Levels and Risk of Death from Coronary Heart Disease
The following chart shows the result of an analysis by biochemistry professor William E. Lands, Ph.D., in which he compared the estimated Percent Omega-3 Levels in HUFA in the blood of people from different regions to their risks of death from coronary heart disease.

Your Percent Omega-3 in HUFA Score is marked on the sloping line as a blue diamond (◆):



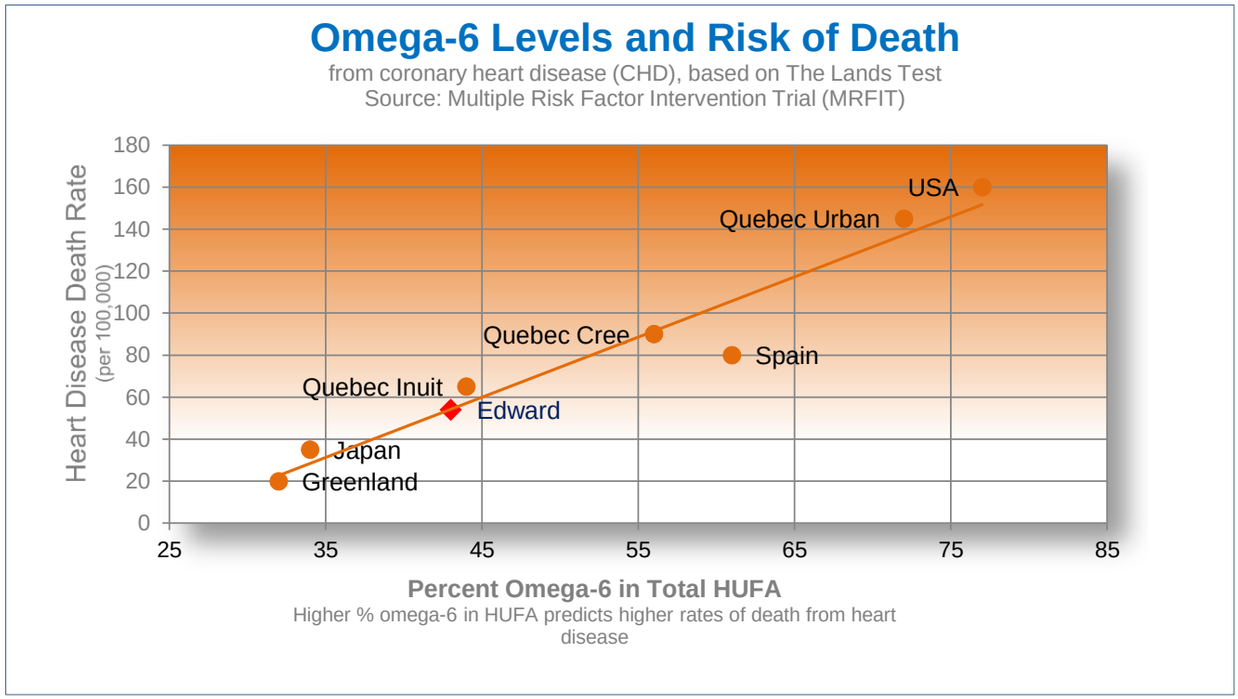
4. Your Percent Omega-6 in HUFA Score
Your Percent Omega-6 in HUFA Score is the part of your total HUFA that's made up of omega-6s. For example, if your score is 50%, then omega-6s make up 50% of the total amount of highly unsaturated fatty acids in your blood.



The average person eating a Standard American Diet has a Percent Omega-6 in HUFA Score of 76%. For optimal heart and overall health, your Percent Omega-6 in HUFA score should be less than 50%.

5. Omega-6 Levels and Risk of Death from Coronary Heart
The following chart shows the result of an analysis by Dr. Lands, in which he compared the estimated Percent Omega-6 Levels in HUFA in the blood of people from different regions to their risks of death from coronary heart disease.

Your Percent Omega-6 in HUFA Score is marked on the sloping line as a red diamond (◆):



Your Complete Test Results
The table on the following page lists all the fatty acids in your blood. This table is followed by additional information about selected results that your health practitioner may find useful in formulating medical or dietary advice.

The Vital Omega 3 and 6 HUFA Test™

Percents of Fatty Acids in Blood		Sample Date:	11/21/2013	Sample:	Blood Spot
Name:	Edward Jones	Report Date:	12/12/2013	Patient Number:	19965

Fatty Acid	Common Names	Edward	Typical USA
14:0	Myristic	0.92	0.64
14:1	Myristoleic	0.06	0.05
15:0	Pentadecanoic	0.00	0.21
15:1		0.00	0.09
16:0	Palmitic	20.19	21.05
16:1w9		0.00	0.08
16:1w7	Palmitoleic	1.13	1.11
17:0	Heptadecanoic	0.00	0.21
17:1		0.00	0.10
18:0	Stearic	8.62	11.92
18:1w9	Oleic	14.63	17.79
18:1w7	Vaccenic	0.00	0.00
18:1w5		0.00	0.00
18:2w6	Linoleic (LA)	26.04	25.10
18:3w6	Gamma-linolenic (GLA)	0.12	0.24
18:3w3	Alpha-linolenic (ALA)	0.82	0.52
18:4w3	Steridonic acid (SDA)	0.25	0.05
20:0	Arachidic	0.08	0.18
20:1w9		0.17	0.04
20:1w7	11-Eicoenoic	0.12	0.22
20:2w6	Eicosadienoic	0.29	0.34
20:3w9	Mead's acid	0.02	0.06
20:3w6	Dihomogamma-linolenic acid (DGLA)	1.16	1.31
20:4w6 (AA)	Arachidonic (AA)	9.22	10.81
20:3w3	Eicosatrienoic acid-omega 3	0.14	0.07
20:4w3	Eicosatetraenoic acid-omega 3	0.10	0.04
20:5w3 (EPA)	Eicosapentaenoic (EPA)	4.75	0.59
22:0	Behenic	0.15	0.21
22:1w9	Erucic	0.12	0.03
22:4w6	Docosatetraenoic	0.57	0.76
22:5w6	Docosapentaenoic -omega 6	0.18	0.41
22:5w3 (DPA-w3)	Docosapentaenoic -omega 3	2.27	0.96
24:0	Lignoceric	0.36	0.21
22:6w3 (DHA)	Docosahexaenoic (DHA)	7.54	2.59
24:1	Nervonic	0.00	0.12
Other		0.00	1.89
Total		100.00	100.00
Saturated	Total Saturated fatty acids	30.32	34.42
Monounsat	Total Monounsaturated fatty acids	15.09	18.42
PUFA	Total Polyunsaturated fatty acids	53.46	43.85
HUFA	Highly unsaturated fatty acids	25.94	17.60
T/T Ratio	Triene/Tetraene ratio	0.00	0.01
Total w3	Total Omega 3	15.86	4.82
Total w6	Total Omega 6	37.58	38.97
Total w9	Total Omega 9	14.97	18.03
w6/w3	Omega 6 to Omega 3 Ratio	2.37	8.09
AA/EPA	AA (20:4w6) to EPA (20:5w3) ratio	1.94	18.32
% Omega 3 HUFA	Percent of Omega 3 in HUFA	57.02	24.15
% Omega 6 HUFA	Percent of Omega 6 in HUFA	42.98	75.85
WB EPA+DHA	Whole Blood EPA + DHA	12.29	3.18
RBC EPA+DHA	RBC EPA and DHA (Omega 3 Index)	17.15	3.37

*Typical USA results are those from individuals who consume no omega-3 supplements.

Understanding Selected Vital Test Data

Omega-3 ALA
This is the total amount of ALA (alpha-linolenic acid) in your blood, as a percentage of all fatty acids. Certain plant foods contain this "short-chain" omega-3 fatty acid, less than 10 percent of which the body may convert into the "long-chain" omega-3 HUFA (EPA and DHA) it actually needs.

- The average person eating the Standard American Diet will have an ALA score of less than 1%.
- For optimal health, the ALA level in your blood should exceed 2%.

Omega-3 EPA
This is the total amount of EPA (eicosapentaenoic acid) in your blood, as a percentage of all fatty acids. The average person eating the Standard American Diet will have an EPA score of less than 1%.

- For optimal health, the EPA level in your blood should exceed 3%.

Omega-3 DPA
This is the total amount of DPA (docosapentaenoic acid) in your blood, as a percentage of all fatty acids. DPA is a lesser-known omega-3 fatty acid that is increasingly seen as important to health, in part because it can be converted to DHA by the body.

- The average person eating a Standard American Diet will have a DPA score of less than 2%.
- For optimal health, the DPA level in your blood should exceed 2%.

Omega-3 DHA
This is the total amount of DHA (docosahexaenoic acid) in your blood, as a percentage of all fatty acids.

- The average person eating the Standard American Diet will have a DHA score of less than 3%.
- For optimal health, the DHA level in your blood should exceed 5%.

Total Omega-6 Score
Omega-6 fatty acids are essential to health, but occur in extreme excess in the Standard American Diet. This is especially true of polyunsaturated linoleic acid (LA), which predominates in the most commonly used vegetable oils (corn, soy, safflower, sunflower, cottonseed) and the processed foods made with them. LA is converted in the body to an omega-6 HUFA called AA (arachidonic acid).

Omega-6 AA is the precursor to various hormone-like compounds called eicosanoids (eye-cos-ah-noyds), which strongly influence immune system processes. Having an excess of AA in your blood tends to produce a pro-inflammatory environment in the body.

- The average person eating the Standard American Diet will have an AA score of about 13%.
- For optimal health, the AA level in your blood should be less than 9%.

DGLA (dihomo-gamma-linolenic acid) is created when the body converts dietary omega-6 LA to omega-6 AA. People's DGLA levels don't generally reveal much about their heart health. Although other omega-6s generally promote and sustain inflammation, DGLA typically exerts inflammation-moderating effects.

Omega-6/Omega-3 Ratio
This result provides a general measure of where you stand in comparison to the U.S. average and to the optimal ratio (less than 5:1 omega-6s to omega-3s).

By itself, your Omega-6/Omega-3 Ratio has limited meaning because it does not reflect the amounts of these fatty acids in your blood. Having a "good" (low) ratio of omega-6s to omega-3s might provide a false sense of security if the amounts of both are too low.

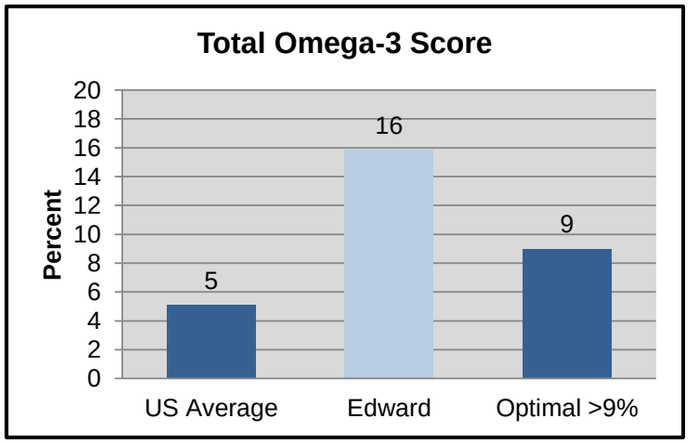
However, it's good news if you have a low Omega-6/Omega-3 Ratio (less than 5:1) and your Total Omega-3 Score equals or exceeds the "optimal" level (more than 9%).

AA/EPA Ratio
This is the ratio of the omega-6 AA to the omega-3 EPA in your blood. AA is essential to human health and only becomes bad in excess.

- For optimal health, you should have no more than five times as much AA as EPA; i.e., your ratio should not exceed 5:1.

Total Omega-3 Score
This reveals *all* of the omega-3 fatty acids in your blood, not just your omega-3 HUFA (EPA, DHA, and DPA). For example, if your omega-3 score is 5%, it means that 5% of all the fatty acids in your blood are omega-3s.

The Total Omega-3 Score is useful for monitoring your levels, but isn't nearly as valuable an indicator of risk for coronary health disease as your Vital O-Mega Scores™.



Optimally, your Total Omega-3 Score should be higher than 9%. According to the results of several major epidemiological and clinical studies, this optimal score is linked to:
- 40% lower risk of all heart-related deaths (Dolecek TA 1992)
- 19-28% reduction in risk of sudden death from any cause (Albert CM et al. 2002)
- 50% reduction in the risk of sudden cardiac arrest (Siscovick DS et al. 1995)
- 10-30% drop in the risk of a stroke or second heart attack (Marchioli R et al. 2001)

People from regions where seafood is consumed in abundance – such as Japan and Greenland – often have total omega-3 scores greater than 15%.

Omega-3 Index
The Omega-3 Index measures the concentration of EPA and DHA as a percent of total fatty acids in red blood cell membranes. In recent years a significant body of research has been published showing the Omega-3 Index to be a good predictor of heart disease risk, and especially the risk of dying from a sudden heart attack, which contributes to over half of heart disease-related deaths. These studies have shown that an Omega 3-Index of 8% or greater is desirable for its cardio-protective benefits, and a score below 4% is undesirable.

Next Steps: What happens now?
If all your Vital Omega Test scores are in the optimal range, congratulations are in order. You're making the right dietary choices to help support optimal health!

But don't be discouraged if – like the vast majority of Americans – your omega-3 numbers are too low and/or your omega-6 numbers are too high.

You can *easily* improve your scores (and your health) by increasing your intake of omega-3s and reducing your intake of omega-6s.

As Dr. Lands advises: "Eat the threes and nix the sixes." To do that, cut back on commonly used vegetable oils that are high in omega-6s (corn, soy, safflower, sunflower, cottonseed) and the fried, packaged, and processed foods that contain them.

To raise your omega-3 levels, enjoy seafood frequently – especially omega-3-rich fatty fish like wild salmon, tuna, sablefish, and sardines – and/or take a high-quality omega-3 supplement such as wild salmon oil or krill oil, daily.

You should strive for a total daily intake of 1000mg* of omega-3 EPA+DHA. You can achieve this by enjoying 3 to 4 servings of fatty fish per week, 3 to 5 standard fish oil capsules a day, or a combination of both.

Take these steps, then test your blood again in a few months. We think you'll be pleased with the results!

*Our recommendation is based on guidance from the scientific bodies with the greatest expertise in this area – the UN World Health Organization (WHO), the International Society for the Study of Fatty Acids and Lipids (ISSFAL), and the American Heart Association (AHA):

- WHO recommends 250mg to 500mg of omega-3 EPA+DHA per day.
- ISSFAL recommends 500mg to 650mg of omega-3 EPA+DHA per day.
- AHA advises 1000mg of omega-3 EPA+DHA per day for heart patients, and 2000mg to 4000mg grams per day to lower high blood triglyceride levels. (AHA makes no omega-3 intake recommendation for healthy people, advising them to eat at least two servings of seafood per week.)

Sage Health Advice

Maintaining the right balance between omega-3 and omega-6 fats is absolutely vital for your health.

– Mehmet Oz, M.D.

The best way to increase the omega-3s in one's tissues is to not only increase consumption of omega-3s but to also decrease consumption of the competing omega-6s.

– Dr. Ralph Holman, pioneering fats researcher who coined the term "Omega-3"

The ratio of omega–6 to omega–3 EFA is an important determinant of health. It is essential to decrease omega–6 intake while increasing omega–3 in the prevention and management of chronic disease.

– Artemis P. Simopoulos, M.D., founder of the Center for Genetics, Nutrition and Health and author of more than 300 articles, papers and books, including *The Omega Diet.*

Individuals, physicians, health insurers and policymakers could revolutionize preventive health care, and reduce related costs and suffering, by monitoring proportions of omega-3 and omega-6 blood fatty acids, and encouraging dietary choices that improve them.

– William E. Lands, Ph.D., who discovered that omega-3 and omega-6 fatty acids compete for absorption into our cells

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The natural healing force within each one of us is the greatest force in getting well. Our food should be our medicine. Our medicine should be our food … leave your drugs in the chemist's pot if you can heal the patient with food.

– Hippocrates

About William E. Lands, Ph.D.

Dr. Lands, who is one of the world's leading experts on the roles of fatty acids in human health, was a professor of biochemistry at the University of Michigan, and is an emeritus advisor to the National Institutes of Health (NIH). He has more than 200 relevant, peer-reviewed scientific papers to his name.

We gratefully acknowledge Dr. Lands' guidance in helping to ensure that the blood tests featured in The Vital Omega 3 and 6 HUFA Test™ are scientifically and clinically meaningful.

His analyses of the best available epidemiological evidence show that a person's Percent Omega-3 in HUFA Score and Percent Omega-6 in HUFA Score are the most reliable predictors of their risk of dying from heart disease.

Sources and Resources

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Further Reading

- How to Save a Trillion Dollars

Papers by Professor William E. Lands, Ph.D.

- False Profits and Silent Partners in Health Care
- Measuring Blood Fatty Acids as a Surrogate Indicator for Coronary Heart Disease Risk in Population Studies

Relevant research papers

- Gordon Bell J et al. Using a fingertip whole blood sample for rapid fatty acid measurement: method validation and correlation with erythrocyte polar lipid compositions in UK subjects. Br J Nutr. 2011 Jun 1:1-8.
- Metherel AH, Armstrong JM, Patterson AC, Stark KD. Assessment of blood measures of n-3 polyunsaturated fatty acids with acute fish oil supplementation and washout in men and women. Prostaglandins Leukot Essent Fatty Acids. 2009 Jul;81(1):23-9. Epub 2009 Jun 9.
- Ramsden CE et al. n-6 Fatty acid-specific and mixed polyunsaturate dietary interventions have different effects on CHD risk: a meta-analysis of randomised controlled trials. Br J Nutr (2010). doi:10.1017/S0007114510004010

Relevant research news

- Heart Group's Omega-6 Advice Takes a Huge Hit
- Omega-3 / Omega-6 Balance section of Vital Choices newsletter archive