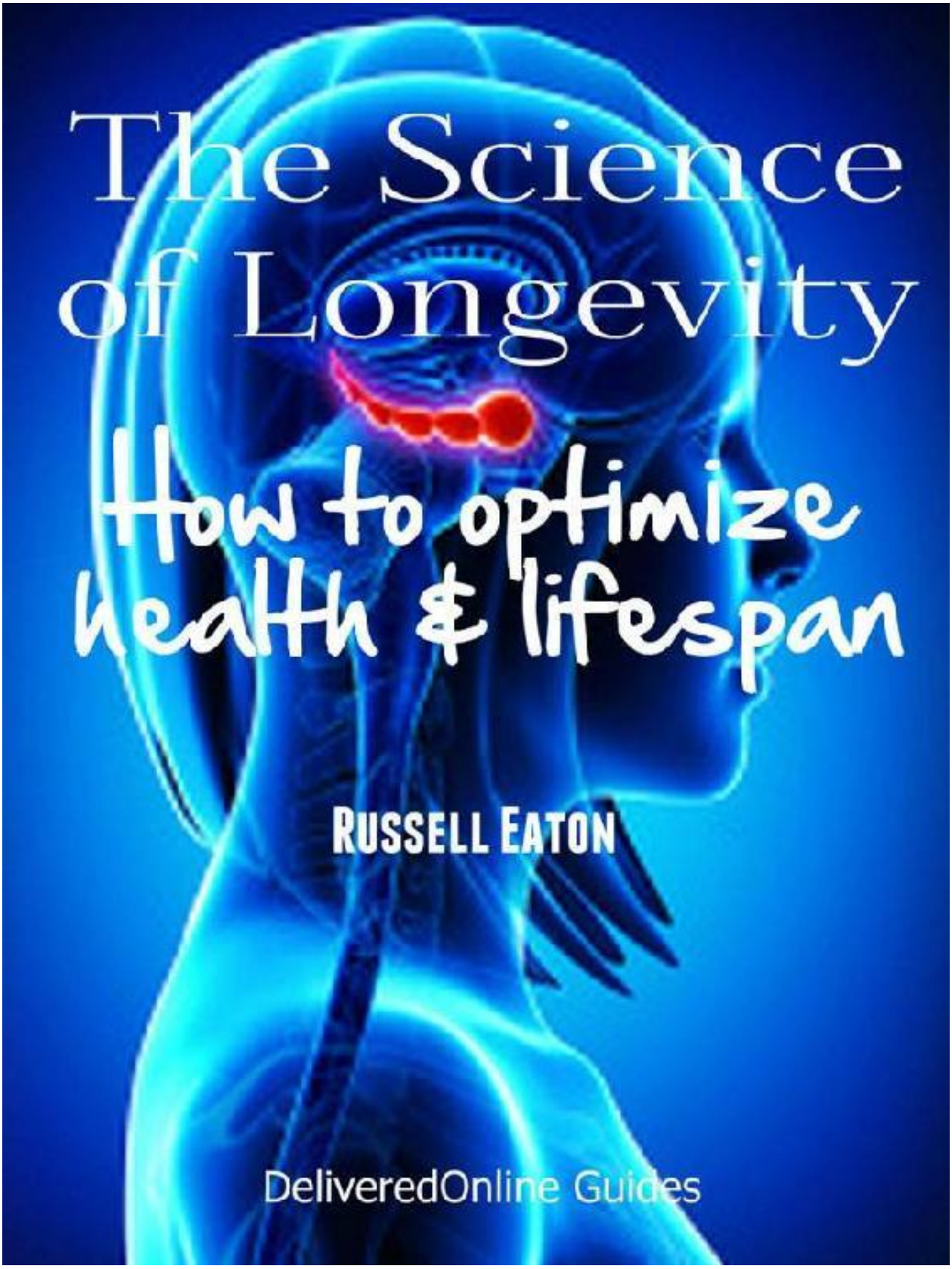
The Science of Longevity
How to optimize health & lifespan
RUSSELL EATON
DeliveredOnline Guides

The Science of Longevity
How to optimize health & lifespan

Russell Eaton

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Introduction

Most people want to live a long life provided you can remain reasonably healthy in your old age. Being healthy throughout life is by far the greatest way to extend your life. But to simply say *"be healthy if you want to extend your life"* is not enough and much too vague.

Taking action to improve your health is something that anybody can do regardless of your current circumstances and state of health. It is never too late. Clearly, if you need expensive medical attention for a specific condition, then having money may help. But that apart, you don't need to be a millionaire to be super healthy. What you need is a blueprint (a strategy if you like) that you can follow, step by step to optimize your health. This book gives you that.

In the context of good health, there are two things to always keep in mind throughout your life:

1. Being in good health is a wonderful, even exhilarating thing. Always remember this and never take your good health for granted.

When you are healthy you tend to take your good health for granted. It is only when you are not feeling so great (or when you're ill or in pain) that you long for good health. By really appreciating the wonder of good health you will be more motivated to strive for it.

2. Achieving good health is as much about what ***not*** to do as what to do. So always remember there are two sides to the coin.

If you smoke, drink to excess, take drugs, breath in polluted air, eat junk food, etc. you are polluting your body. This makes you old before your time and this prevents good health. So being healthy is not only about following healthy lifestyles, it's also about ***not*** following unhealthy lifestyles.

To summarize this point, always remember two things: 1. Appreciate good health and don't take it for granted, and 2. Realize that achieving good health also involves ***not*** doing unhealthy things.

If you're expecting a diet book with recipes, diet plans and weight-loss strategies please do see our sister book *'The Lipo Diet'*. This book, ***The Science of Longevity,*** is entirely focused on health optimization and lifespan extension. The very latest research is evaluated, and you are given a blueprint for vastly improving your health and living longer.

Unlike other books which focus on the historical and social aspects of longevity, this book is a practical manual showing how to be fit, young and healthy into your old age. In spite of the scientific approach, it is written in plain language with no fluff or hot air.

It used to be thought that the long-lived inherited some kind of 'longevity gene', but modern research has shown that a specific longevity gene is a myth. The genetic aging process is likely the result of hundreds of thousands of closely intertwined genetic factors rather than a specific longevity gene. It could be that in the future, with greater computing power, it will be possible to identify these genetic differences and apply them to unborn babies. But current medical science cannot do this, nor is it possible to 'turn on' certain genes that promote longevity (another myth).

A question that is often asked in relation to longevity is: *how can you live longer?* And another question is: *what is the most common cause of death in the long lived?* Both these questions are linked and here is the answer.

Most deaths are caused by auto-accidents, violence, accidental poisoning, or chronic illness (e.g. smoking, alcohol and drug abuse can cause chronic illness). And guess what, the long-lived die from ***exactly the same causes*** as everybody else. But there is one important difference, when the long-lived die from chronic illness they do it 20-30 years later compared to others.

Note: chronic illness is also referred to as chronic inflammation, since they go hand in hand. Tackling chronic inflammation will combat chronic illness, improve health and extend life. For this reason much research into longevity is focused on dealing with chronic inflammation. The strategies in this book help combat chronic inflammation. The terms 'chronic illness' and 'chronic inflammation' are interchangeable in this book.

"What do most major life-threatening illnesses have in common? It's not genetics or lifestyle, but chronic inflammation. Fighting this silent fire within will not only help you live longer, it will help you live better". Source: Alison Garwood-Jones, The secret to longevity, December 2010, http://alisongarwoodjones.com.

The secret to longevity is to postpone death from chronic illness by 30 years or so. And you do this by optimizing health throughout your life. The strategy then is to 'postpone' chronic illness, i.e. to postpone or avoid as long as possible illnesses like Alzheimer's, cancer, heart disease, stroke, Parkinson's, and others.

Chronic illness kills more people than all the other mortality causes put together. It is defined as a human health condition that is persistent or long-lasting and comes with time. The term 'chronic' is often applied when the course of the disease lasts for more than three months. You may not even know that you have a chronic health condition until it catches you unawares, such as an unexpected heart attack.

Dr. Peter Attia, M.D. (http://eatingacademy.com) rightly says that a key to longevity is to avoid harmful behaviours and he summarizes the eight key things we can do to optimize health and live longer as follows:

1. **What we eat**
2. **How we move**
3. **How we sleep**
4. **How we manage chronic stress**
5. **How our hormones are optimized**
6. **What drugs we take**
7. **What our sense of purpose is**
8. **Our social support network**

From this we can distil it down further to three very broad headings:

1. **Diet:** Follow a healthy diet.
2. **Lifestyle:** Follow a healthy lifestyle (physical activity, sleep well, social support, avoid stress).
3. **Pollution:** Avoid polluting your body.

We will look at each of these three broad topics under various sub-headings throughout this book.

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The takeaway message: it is never too late to improve your health and extend your lifespan. The sooner you start the better. The key to longevity is to avoid chronic inflammation.

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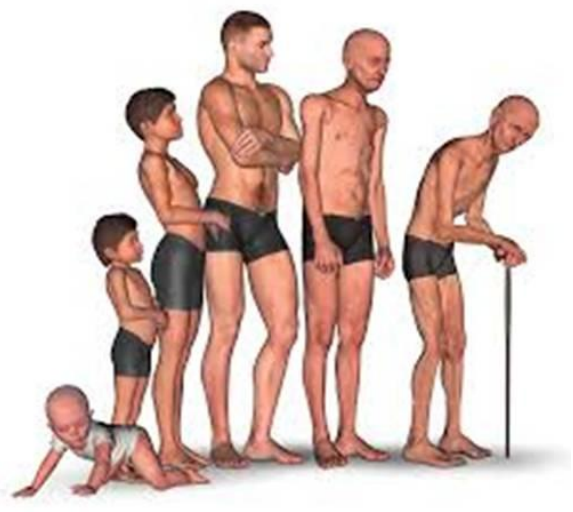

Longevity Falsehoods

Myths and misconceptions around the subject of longevity abound, mainly because of the huge health and pharmaceuticals industries trying hard to peddle their wares. By recognising such falsehoods you will be better equipped to optimize your health and live longer. Here are some of the falsehoods relating to longevity, which are examined under the following headings:

Resveratrol
Destiny
Programmed senescence
Calorie restriction
Antioxidant Supplements
CoQ10
Exercise
Krill Oil
Glutathione
Omega-3 Oil

*

Resveratrol

Falsehood: resveratrol supplements help improve health and prolong life.

Reality: resveratrol supplements do not improve health or prolong life.

The research is quite clear in showing that resveratrol does nothing to combat chronic disease or extend life. Don't waste your money buying any kind of resveratrol supplements; they are shown to be harmful and unhealthy. For example, some research shows that resveratrol nullifies the benefits of healthy physical activity: Gliemann L, et al, Resveratrol blunts the positive effects of exercise training on cardiovascular health in aged men, J Physiol. 2013 Oct 15; 591(20):5047-59.

Even dietary resveratrol is shown to be ineffective in terms of improving health or extending life.

"This study of nearly 800 older community-dwelling adults shows no association between urinary resveratrol metabolites and longevity. This study suggests that dietary resveratrol....does not have a substantial influence on inflammation, cardiovascular disease, cancer or longevity. There was also no difference [between those taking and not taking resveratrol] in the risk of developing cancer or cardiovascular disease. Relying on a single substance to keep you healthy is not recommended". Source:

Semba RD, et al, Resveratrol Levels and All-Cause Mortality in Older Community-Dwelling Adults. JAMA Internal Medicine, May 2014.

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"There is no evidence of benefit from resveratrol in those who already have heart disease. There is no evidence of an effect of resveratrol on cancer in humans. There is no conclusive human evidence for an effect of resveratrol on metabolism. There is no evidence for an effect of resveratrol on lifespan in humans as of 2016. In 2010, GlaxoSmithKline (GSK) suspended a small clinical trial of ..... resveratrol due to safety concerns, and terminated the study later that year. There is not enough evidence to recommend consumption of resveratrol beyond the amount that can be obtained through dietary sources, and more human clinical trials are needed". Source: Wikipedia.

Destiny

Falsehood: Maximum lifespan is already destined. Whatever one does you will not live longer than the pre-determined destiny. Therefore you cannot extend lifespan beyond the period that one is destined to live.

Reality: There is no pre-determined destiny to longevity (this is superstitious nonsense). Barring accidents, your lifespan is entirely determined by how you live your life. Unhealthy lifestyle factors such as smoking, alcoholism, a junk diet and so on will shorten your life.

Put another way, the body does not move inexorably towards a particular tipping point in time that we call death. Why not? Because the body is not a closed system, unaffected by exterior events. Diet, healthy lifestyles and other factors within your control determine your state of health and lifespan.

Taking unnecessary risks can also shorten your life. Examples: drunk driving, indulging in extreme/dangerous sports, over-taxing the body with intense exercise, exposing yourself to mugging in dark alleys late at night, regularly getting sunburnt (I think you get the picture).

The fact remains that if you make good choices, take good care of yourself and follow sound and healthy lifestyle factors, you can dramatically improve your health and live longer, even beyond a 120. You are not destined to die at 60, 70 or 80. You absolutely can control how long you live!

Programmed senescence

Falsehood: the body is programmed to die within a set period of time regardless of how healthy we are.

Reality: the body is not programmed to die within any set period of time, and a lot depends on our state of health.

As explained later in the book, our chromosomes have 'telomeres' at their tips. It is known that when our telomeres become too short we age more quickly and die sooner than otherwise.

The theory of 'programmed senescence' states that aging is driven by an innate internal clock that is controlled by gene expression. This internal clock is represented by our telomeres and 'senescence' refers to the point at which body cells cease to divide. It is well known to science that there is an upper limit to the number of times that a cell can divide, after which it dies. In other words, when the chromosome telomeres become too short, the cell can no longer divide.

The concept that our telomeres are governed by some kind of innate internal clock beyond our control is false, and hence the theory of programmed senescence is false. This is so because there is a lot that we can do to preserve our telomeres. So although just the act of living does indeed gradually shorten our telomeres, we can slow down this shortening process by optimizing health and following healthy lifestyle factors. By slowing down the 'wear and tear' of our telomeres we can greatly extend life.

Calorie restriction

Falsehood: it is believed by some that a calorie restriction diet can extend life.

Reality: in fact any kind of calorie restriction is unhealthy and certainly will not extend life. We won't dwell on this subject as it is fully covered in the chapter "The Calorie Restriction Myth".

Antioxidant Supplements

Falsehood: antioxidant supplements are good for you because they fight off disease and prevent premature aging of the body.

Reality: antioxidant supplements should be avoided as they cause nothing but harm.

The body's natural defences against oxidative damage are referred to as 'antioxidants'. They play a vital role in keeping us alive and well, and fighting off disease and the premature aging of the body. But it does not follow that taking antioxidant ***supplements*** is in any way healthy. Our body is perfectly capable of making all the antioxidants that it needs for good health.

The evidence shows that taking antioxidant supplements such as vitamins A, C, and E is counter-productive and conducive to disease and aging of the body.

There is a vast health industry that tries hard to sell you the false message that antioxidant supplements are good for you, so it is easy to be seduced into taking such supplements. This subject is examined at greater length in the chapter titled "Live Longer by Reducing Oxidative Stress".

CoQ10

Falsehood: CoQ10 supplements combat aging and illness and should be consumed regularly.

Reality: CoQ10 supplements do not combat aging and illness, and should do not be consumed regularly, if at all.

It is startling to think that according to a survey by Consumer Lab, Coenzyme Q10 is taken by 53% of the U.S. population, and yet this supplement is not proven to be beneficial.

CoQ10 is produced by the body and used for everyday functions of life including cellular energy. It is a fat-soluble antioxidant that transports electrons around the body, and is required by every single cell. To make energy, tiny organelles called mitochondria take fat and other nutrients and make useable energy within each cell. This conversion process needs CoQ10, so you can see it is an essential element to daily life.

As we age our body produces less CoQ10. This is part of the natural aging process. It is therefore argued that CoQ10 supplements can make up any shortfall in the amount that is produced naturally by the body.

However, there is no evidence that taking CoQ10 supplements makes up for any shortfall in the body's natural production of this vitamin. Furthermore, we can easily obtain CoQ10 from the diet. CoQ10 is naturally present in small amounts in a wide variety of foods and we only need a very small amount from the diet. In fact, few people experience deficiencies of this nutrient even in old age, although metabolic and mitochondrial disorders may increase the risk of deficiency.

Levels of CoQ10 are particularly high in organ meats such as heart, liver, and kidney, as well as beef, soy oil, sardines, mackerel, and many types of nuts and seeds. As explained in this book, it is not recommended that you include cooked meat in your diet because such food increases the risk of cancer. But a varied diet of salads, vegetables, sprouted seeds, nuts and seeds will give you plenty of CoQ10 without having to resort to supplements.

Furthermore, overdosing of CoQ10 can be harmful. Possible side effects include insomnia, rashes, nausea, upper abdominal pain, dizziness, diarrhea, sensitivity to light, irritability, headache, heartburn, and fatigue. CoQ10 might also reduce sperm production in men, cause a decrease in blood pressure and lead to an elevation in liver enzymes. Note also, that CoQ10 can interfere with certain medications such as anticoagulants and statins.

The evidence that CoQ10 supplements are beneficial is in fact very weak. Here's an abridged extract from Wikipedia.org in regard to CoQ10:

"CoQ10 is not approved by the U.S. Food and Drug Administration (FDA) for the treatment of any medical condition. A 2014 Cochrane Collaboration meta-analysis found no convincing evidence to support or refute the use of CoQ10 for the treatment of heart failure. Evidence with respect to preventing heart disease in those who are otherwise healthy is also poor.

A 2009 Cochrane review concluded that studies looking at the effects of CoQ10 on blood pressure were unreliable, and therefore no conclusions could be made regarding its effectiveness in lowering blood pressure.

Available evidence suggests that CoQ10 is likely ineffective in moderately improving the chorea associated with Huntington's disease.

While CoQ10 can improve some measurements regarding sperm quality, there is no evidence that CoQ10 increases live births or pregnancy rates".

No large well-designed clinical trials of CoQ10 in cancer treatment have been done. The U.S. National Cancer Institute identified issues with the few, small studies that have been done stating, *'the way the studies were done and the amount of information reported made it unclear if benefits were caused by the CoQ10 or by something else'*. Also, the American Cancer Society has concluded that CoQ10 may reduce the effectiveness of chemo and radiation therapy, so most oncologists would recommend avoiding it during cancer treatment.

A review study has shown that there is no clinical benefit to the use of CoQ10 in the treatment of periodontal disease. Most of the studies suggesting otherwise were outdated, focused on in-vitro tests, had too few test subjects and/or erroneous statistical methodology and trial set-up, or were sponsored by a manufacturer of the product.

A 2011 review by the 'Cochrane Collaboration' suggesting CoQ10 supplementation might benefit people with Parkinson's disease was subsequently withdrawn from publication following a review by independent editors.

Be aware that when you read about CoQ10 in glowing terms there is likely to be a vested interest in selling CoQ10 supplements.

Exercise

Falsehood: it is false to say that exercise is beneficial, healthy or that it extends life. By exercise, we are referring to any kind of physical exertion that is sufficiently vigorous and sustained as to make you sweat and/or pant for air.

Reality: all kinds of exercise should be avoided in favour of non-sweaty, non-breathless physical activity such as walking. More about this in the chapter "The Exercise Myth".

Krill Oil

Falsehood: krill oil is good for you and provides astaxanthin, a powerful antioxidant.

Reality: krill oil should be completely avoided as it causes nothing but harm.

Krill oil (whether supplied in capsules or as a liquid) is often touted by nutritional suppliers as a panacea for just about any malady you may have. The reasoning is that krill oil is high in astaxanthin, an antioxidant that is said to fight harmful free radicals inside the body.

Astaxanthin is a kind of carotenoid vitamin, and food sources mainly include yeast, salmon, trout, krill, shrimp, crayfish, and crustaceans. It is not required at all in the human diet, although some tentative research shows that astaxanthin may be beneficial in combating cardiovascular, immune, inflammatory and neurodegenerative diseases.

Astaxanthin supplements are cultivated from microalgae and sold as capsules. Such supplements may indeed offer some degree of antioxidant protection in the body, although evidence for this is scarce.

Furthermore, astaxanthin supplements should be used with care and that is why it is usually recommended that they be taken only under medical supervision. The most common use of astaxanthin is as a food dye, and in some countries its use as a food colouring agent is restricted by law.

Astaxanthin supplements may hinder an enzyme called 5-alpha-reductase. As a result, it may keep testosterone from changing into the hormone DHT in the body. Side effects can include lower libido, growth of male breasts, and erectile dysfunction. They may also lower blood pressure and calcium levels to dangerous levels.

This is why astaxanthin supplements should be avoided if you are pregnant or might become pregnant, or if you are taking any kind of immune suppression medication.

When it comes to krill oil it's another story.

The reality is that krill oil is unhealthy and should be completely avoided. It is particularly prone to going rancid when consumed, causing oxidation and free radicals which lead to illness. So, far from providing antioxidant protection, it does the opposite by causing harmful oxidative damage to body cells.

A presentation delivered at the 99th American Oil Chemists' Society (AOCS—the authoritative group in the field) stated: "*Krill decompose very quickly, so the current thinking is either to dry them aboard the vessel and bring the powder back to a land-based plant for oil extraction or to enzymatically digest the krill and then separate the oil.*" Source: Anthony P. Bimbo, Raw material sources for the long-chain Omega-3 market: Trends and sustainability, part 2, 2009, www.aocs.org.

In our sister book "The Fish Oil Myth" it is explained that fish oil in general should be avoided for a variety of reasons. But krill oil is even worse for health than regular fish oil. Here is why:

Krill oil provides EPA/DHA in the phospholipid form instead of the triglyceride form. There is absolutely no evidence that delivering EPA/DHA in the phospholipid from has any benefit. The human species has never consumed krill in the past. Genetically, humans have evolved to ingest triglycerides rather than phospholipids. There is no evidence that phospholipids in the diet are in any way beneficial.

Krill oil is marketed as being high in antioxidants. This is not so because the absolute level of antioxidants in krill is very poor compared to other foods. And once the oil is extracted, put into capsules and retailed through the supply chain, the oil will have degraded, rendering any antioxidant properties of the oil as virtually useless.

Note: Krill, along with algae, is the foundation of the food chain for many oceanic species. Commercial Krill harvesting has been banned in many parts of the world because such harvesting is an ecological disaster waiting to happen. You are urged to not support krill harvesting by consuming food or supplements from krill. And remember that those who promote krill oil may well have a monetary vested interest.

Glutathione Supplements

Falsehood: glutathione supplements are beneficial because they provide a powerful antioxidant that the body needs.

Reality: glutathione supplements should be avoided unless administered under medical supervision for a specific medical condition. The body does not need or require glutathione for good health.

Glutathione is often proclaimed to be the 'master antioxidant' and the most powerful way to reduce oxidative damage in the body. Glutathione supplements are sold, based on the argument that glutathione in the body decreases as you get older, possibly because your body can't create as much. Lower glutathione levels appear to go hand-in-hand with poorer health. For instance, lower levels may play a role in many conditions that are more likely to develop in older people. This is a weak argument with virtually no credible research to back it up.

Glutathione is not an essential nutrient for humans, since it can easily be made in the body from the amino acids L-cysteine, L-glutamic acid, and glycine. These amino acids are plentiful in the diet from many types of foods. But even if these three amino acids are not present in the diet it does not matter because they are not 'essential amino acids' - the body is perfectly capable of making these amino acids and hence making as much glutathione as needed for good health.

Furthermore glutathione does not have to be present as a supplement in the diet; in other words, we simply don't need glutathione supplements for good health.

The importance of glutathione for good health is not being disputed. It is well established that we need glutathione to prevent organ and muscle inflammation, to improve liver/heart/lung function, strengthen immunity, combat cancer and indeed to slow down the aging process.

But we don't acquire glutathione from glutathione supplements. All those glutathione pills that you see in health stores are useless because glutathione cannot be taken orally (it doesn't work biologically when swallowed). We acquire glutathione from a varied diet of fruit, vegetable, eggs, sprouted seeds, nuts, seeds, salads, legumes and the like. These foods provide all the amino acids that we could need.

The argument that glutathione in the body declines with age is disingenuous because just about all kinds of nutrients decline with age. As we age we generally become less capable of making and/or assimilating nutrients.

Glutathione shortage is a rare condition in people of any age (assuming you are reasonably healthy). Doctors can use glutathione supplements in the form of injections to meet specific medical needs such as a paracetamol overdose, but to indulge in such supplementation as a routine anti-aging treatment is ill-advised and completely unproven.

Do not be taken in by the false claims made by those who peddle useless glutathione pills.

Omega-3 Oil

Falsehood: omega-3 oil supplements are very important for the brain and general good health.

Reality: all omega-3 oil supplements should be avoided as they cause nothing but ill-health.

It is widely believed that omega-3 oil, taken as a supplement, is beneficial. It is claimed that omega-3 supplements combat inflammation inside the body, thus preventing illness and pre-mature aging. This myth arises from confusion between omega-3 oil taken as a supplement and omega-3 oil taken in the form of foods that naturally contain such oil. They are worlds apart.

Virtually all commercially processed polyunsaturated oils are made from seeds and sold under names such as Canola Oil, Rapeseed Oil, Safflower Oil, Sunflower Oil, Soybean Oil, Corn Oil and others. They are polyunsaturated oils by virtue of containing Omega-3, Omega-6 or Omega-9 oil (or any mix of the three).

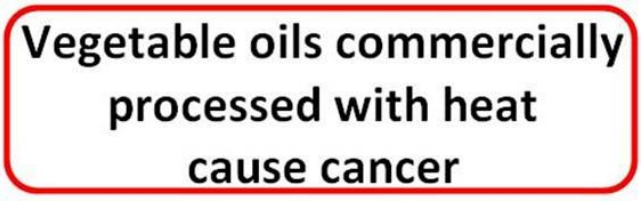
To extract and process the oil from seeds, intense heat is usually used. This has the effect of completely degrading the oil (the molecular structure is changed), and this in turn makes the oil much more likely to oxidize when stored or consumed. In fact, processed polyunsaturated oil will oxidize (i.e. go rancid) at just room temperature so must always be kept refrigerated.

"When you consume polyunsaturated fats at body temperature (which is 37 degrees C, a good 15 degrees C higher than average room temperature), they oxidize very quickly." Source: David Guillespie, The Big Fat Lies, Penguin Books, 2012.

When processed polyunsaturated fat is consumed it oxidizes and triggers free radicals inside the body by virtue of having been intensely heated when commercially processed. This increases the risk of cancer and other serious illness.

When you see un-refrigerated supermarket shelves packed with vegetable oils such as canola oil, Rapeseed Oil, Safflower Oil, Sunflower Oil, and others, you are looking at powerful mutagenic products. The high processing temperatures combined with a complete a lack of refrigeration make such oils toxic to the body and more likely to cause cancer than just about anything else you could consume.

If you use such products for frying or cooking, the mutagenic effect is even greater. These commercially processed vegetable oils should carry a health warning akin to cigarette packs. Something like: '***Warning: This Oil Causes Cancer***'. Or: ***'Warning: This oil clogs the arteries and causes heart attacks and stroke'.***



Omega-3 and Omega-6 oils are regarded as 'essential' polyunsaturates because the body cannot make them. We can only make two kinds of fats: saturated and

monounsaturated, and these two fats make up 97 percent of our body-fat. The other 3 percent of body-fat should come from Omega-3 and Omega-6 fats that we need to obtain from the diet.

This begs the question: if polyunsaturated fats are so bad for health how is it that omega polyunsaturated fats are essential in our diet?

The answer to this paradox is twofold: firstly, we need very little omega polyunsaturated fat for good health, and secondly a nutritious, varied diet will give you more than enough Omega-3 and Omega-6 lipids.

We need no more than 3-5 percent of the fat in our diet (and probably much less) to come from Omega-3 and Omega-6 oils naturally contained in food. For hundreds of thousands of years humans have obtained polyunsaturated omega fats mainly from raw nuts, seeds, berries, grubs, roots, flowers, herbs, insects, and from occasional meat and seafood (never from processed seed oils until very recently in human history).

There are small amounts of Omega-3 and Omega-6 fats in many plant-based foods. In today's world nuts and seeds provide the best and most readily available sources of polyunsaturated fats if consumed raw/fresh and in moderation.

Omega-3 and Omega-6 work together in our body and depend on each other, but the actual ratio of Omega-3 to Omega-6 is unimportant. It is a myth that human beings need to get Omega-3 and 6 in a certain ratio, such as a ratio of 2:1 or 1:1. If you think about it the idea is absurd: as mentioned, our remote ancestors ate a variety of nuts, seeds, berries, grubs, insects, flowers, herbs, roots (and occasional meat) and all these food products had greatly differing ratios of Omega-3 and 6.

Furthermore, only some of these items would be consumed on any one day, depending on what could be foraged or caught on a day-to-day basis. Therefore, the ratio of Omega3/6 will have varied wildly from day-to-day and week-to-week. It simply cannot be argued that humans have evolved for millennia on any particular ratio of dietary Omega-3/6.

Several studies have looked at the health effects of a diet high in Omega-6 and low in Omega-3 and have rightly concluded that the preponderance of Omega-6 in modern-day diets is a cause of illness. But such studies have falsely concluded that the health problems of such a diet are due to the high ratio of Omega-6. Such studies have not taken into account the fact that the harm caused by commercial vegetable oils is due to the intense heat used to extract the Omega-3/6 from the seeds. As mentioned, any kind of oil (particularly polyunsaturated oil) that has been heated causes oxidation and free radicals once consumed. It is this oxidation that causes illness, not any particular Omega oil ratio.

Providing the diet includes natural foods with unprocessed Omega-3 and 6 (in any ratio), the body will simply use both Omega-3 and 6 for its needs and any surplus Omega-3 or 6 is simply stored or excreted. The crucial factor here is to not consume processed Omega-3 or 6 from any source that has involved intense heat at any point. Hence, either consume unprocessed Omega oils from the original sources, such as raw

nuts and seeds, or at the very least ensure that the oil being used has been cold-pressed and has been refrigerated at all times in the supply chain and at home.

The typical American diet is said to have an Omega-3 to Omega-6 ratio of between 1:18 to 1:25 (in other words too much Omega-6 compared to Omega-3). This is indeed unhealthy, but not because of the ratio itself, but because virtually all the Omega-6 oil consumption will have typically come from processed oils that have used intense heat as part of the commercial oil extraction process.

"*The idea that this Omega ratio matters is a myth…without any data to support it*." Source: Walter Willett, MD, PH, American physician and nutrition researcher and Professor of Epidemiology and Nutrition and the chair of the department of nutrition at Harvard School of Public Health.

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"*The optimal quantity and type of Omega-3 fatty acid, and the optimal ratio of Omega-3 to Omega-6 fatty acid (if such an optimal ratio exists), remain undefined*". Source: Wang C, et al, Effects of Omega-3 Fatty Acids on Cardiovascular Disease, Evidence Report/Technology Assessment No. 94, prepared by Tufts-New England Medical Center, Publication No. 04-EOO9-2, March 2004.

*

"In 2011 the Academy of Food and Nutrition (previously known as the American Dietetic Association) invited several heavy hitters in the field of nutrition to debate [polyunsaturated oils]. These experts were in complete and utter agreement—that the ratio of Omega-6 to Omega-3 fats in the diet is totally unimportant". Source: Article posted on April 18, 2012 at www.quickanddirtytips.com: Monica Reinagel, MS, LD/N, CNS, Does the Ratio of Omega-6 Fats Really Matter?

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"There are fundamental problems with using an Omega 6/3 ratio in dietary recommendations.... the ratio takes care of itself." Source: Dr. William Harris, research professor at the Sanford School of Medicine in South Dakota, and an established authority on Omega-3 fats.

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"A group of nutrition scientists was convened by the American Heart Association to assess the validity of a target Omega 6/3 ratio. The scientists found that the use of a ratio as dietary advice for individuals is not only difficult to measure and implement, but there are flaws and limitations in applying such a target ratio for assessing risk of disease. Other researchers indicate that the ratio between the two fatty acids is unimportant". Source: Omega-6 Fatty Acids and Health Fact Sheet, International Food Information Council Foundation, June 5, 2009.

To summarize, we only need a minute amount of the polyunsaturate fatty acids Omega-3 & 6 for optimum health. In particular, polyunsaturated fats that have been processed with heat should be avoided as they rapidly oxidize and harm the body once consumed.