DOWNLOAD PDF ESSENTIAL FATTY ACIDS AND IMMUNITY MENTAL HEALTH

Chapter 1 : Fish Oil Supplements: Are the Fish Oil Benefits True?

The proper diet for brain health needs quality of essential fatty acids. The brain and the myelin sheath (that protects the neurons) are about 75% fat. If the brain doesn't get adequate essential fatty acids, it can't function properly.

Omega-3 fatty acids like DHA and EPA play a role in everyday health and wellness, particularly when combined with maintaining a healthy body weight and regular exercise. Here are the top benefits that you can get from omega-3 fatty acids. Deficiencies of these fatty acids in the diet can lead to dry, irritated skin, and dandruff, while their presence helps maintain skin moisture and support hair growth. Some small studies link increased consumption with a reduction in the symptoms of eczema, perhaps due to its anti-inflammatory properties. One review of the scientific literature found that increased fish oil consumption reduces the rate of adverse cardiac outcomes such as heart attack and stroke. DHA is necessary for optimal brain health and cognitive function at all stages of life, from infants and children to adults and the elderly. DHA plays a key role in neural signaling and helps our brains work faster. A deficiency of DHA in the body has been associated with deficits in learning and cognitive function. One review of the literature found that omega-3 fatty acids help discourage mood and anxiety disorders. However, when inflammation does not subside, or when it exists without the presence of an infection, it can have detrimental effects on the body in many ways. The ability of omega-3 fatty acids to reduce inflammation means that fish oil may help with the symptoms of various autoimmune disorders â€” including rheumatoid arthritis, inflammatory bowel disease , asthma, and allergies. A study found that DHA-rich oil enhances the activity of B cells, which are white blood cells that help make antibodies for a healthy immune response. The omega-3 fatty acids in fish oil may improve the function of the glands in the eyes that produce tears, thereby helping to reduce irritation from dry eye. While some studies support the use of high-dose fish oil for macular degeneration, other studies find that fish oil supplements do not alter the progression of the disease. Researchers have found that these oils can reduce cancer-causing compounds, such as prostaglandin E2 in the colon, which may trigger cancer. And various studies associate increased consumption of marine omega-3 fats with a reduced risk of breast cancer. Our bodies evolved to eat whole food rather than the isolated compounds and nutrients found in supplements. But because most fatty fish contains high levels of mercury , relying on whole fish for omega-3s may expose the body to harmful amounts of this toxic metal. Avoiding mercury is important for everyone, but especially for women during pregnancy and breastfeeding. For this reason, the best option for omega-3 fatty acid supplementation comes from plant-based sources, especially microalgae, which do not contain even trace levels of mercury. If you do eat fish â€” such as wild salmon, sardines, anchovies, or herring â€” consume it no more than twice a week.

Chapter 2 : Essential fatty acid - Wikipedia

It helps protect against sun damage Cumulative damage from a lifetime of exposure to the sun plays a major role in premature aging. Rosehip oil contains antioxidants like vitamins A, C, and E. These vitamins have been shown to synergistically combat visible sun damage. They may also help prevent photoaging. With this in mind, rosehip oil may be used to help reduce the negative effects of UV exposure. Talk to your doctor or dermatologist about how you can safely use both in your skincare routine. Hyperpigmentation occurs when excess melanin forms dark spots or patches on the skin. This can result from a number of factors, including: Vitamin A is made up of several nutritional compounds, including retinoids. Retinoids are known for their ability to reduce hyperpigmentation and other visible signs of aging with regular use. Rosehip oil also contains both lycopene and beta carotene. These ingredients are said to have skin-lightening properties, making them staple ingredients in many skin-lightening products. Animal studies indicate that rosehip extract does contain melanin-reducing properties , and may warrant further study for its use on humans. It helps reduce scars and fine lines Rosehip oil is rich in essential fatty acids and antioxidants, which are integral for tissue and cell regeneration in the skin. Participants in this study consumed the powder orally. In a separate study , participants with post-surgical scars treated their incision site twice per day with topical rosehip oil. After 12 weeks of use, the group using rosehip oil experienced significant improvements in scar color and inflammation when compared to the group who received no topical treatment. It helps boost immunity Rosehip oil is rich in antioxidants and polyunsaturated fatty acids, like linoleic acid, which are imperative for preventing the breakdown of cell membranes in the skin. Strong, healthy cells act as a barrier to prevent bacteria from invading the skin, which can lead to outbreaks and infections. Rosehip powder was also shown to reduce the production of MMP-1, an enzyme that breaks down cell structures like collagen. How to use rosehip oil Rosehip oil is a dry oil that easily absorbs into the skin. The oil can be used on its own, or you can add a few drops to another carrier oil or your favorite moisturizer. Rosehip oil can go rancid quickly. To help extend its shelf life, store the oil in a cool, dark place. You can also store it in your refrigerator.

Chapter 3 : Essential Fatty Acids - How They Support Mental Health

Essential fatty acids and mental health - Volume Issue 4 - Brian Hallahan, Malcolm R. Garland Skip to main content We use cookies to distinguish you from other users and to provide you with a better experience on our websites.

What to Take and What to Skip The human body requires four categories of essential nutrients. An essential nutrient is defined as a nutrient that humans need but cannot themselves produce. The four categories of essential nutrients are vitamins, minerals, amino acids and fatty acids. Essential fatty acids must be taken in through foods or supplements because the body cannot synthesize them as it can most other fats necessary for fuel and optimal functioning. There are two essential fatty acids that a healthy adult must obtain through diet or supplementation. They are linoleic acid and alpha-linolenic acid. For infants who are not exclusively breastfed, docosahexaenoic acid DHA is also essential and must be supplemented in formula. However, adults can synthesize DHA without the need for supplementation. Linoleic Acid An essential omega-6 fatty acid, linoleic acid is a doubly unsaturated fatty acid, occurring widely in plant glycosides. It is an essential fatty acid in mammalian nutrition and is used in the biosynthesis of prostaglandins and cell membranes. According to research by Dr. Mestrovic also found that the arachidonic acid metabolized from linoleic acid can form leukotrienes, which are powerful allergy and inflammation regulators in the body. The inflammation response from the conversion of linoleic acid is vitally important as it enlivens the immune system to protect us from infections and other ailments. How can I get an adequate amount of linoleic acid? Fortunately, linoleic acid is not difficult to obtain from dietary sources alone. The typical Western diet is loaded with linoleic acid. Soybean oil is full of linoleic acid and found in most packaged foods, processed foods and even many home-cooked meals. Other foods quite high in linoleic acid include sunflower oil, soybeans, peanuts and sardines. Linoleic acid supplements â€" take or skip? Most people can skip linoleic acid supplements. People who are on an extreme fat-restricted diet or have malabsorption issues might, in isolated cases, need some sort of supplementation. Of course, linoleic acid supplements as with all supplements should be used with care and under the advice of a trusted health care practitioner. Conjugated Linoleic Acid While conjugated linoleic acids CLAs are not considered an essential fatty acid, it is worth mentioning here. Current research is being conducted on CLA, showing that it may be beneficial in terms of disease prevention and treatment. CLA has a similar molecular structure as linoleic acid but with different properties. Animal studies have shown a link between CLA and the reduction of cancer tumors. How can I get an adequate amount of CLA? Eggs from chickens that graze in grassy areas also contain CLA. CLA supplements â€" take or skip? Most of the scientific research has been done on animals, specifically mice. Nonetheless, CLA supplements are being marketed for their potential benefit. Time and further research will provide more conclusive data. For now, skip CLA supplements. This omega-3 essential fat, when metabolized in the body, converts to eicosapentaenoic acid and docosahexaenoic acid better known as EPA and DHA. Once processed in the body, ALA is vital for brain health, general nervous system functioning and cardiovascular health. Higher levels of omega-3 fats have also been linked to reduced risk of breast cancer. How can I get an adequate amount of ALA? Alpha-linolenic acid is an omega-3 fatty acid abundantly found in seeds and seed oils. Ever wonder why the humble chia seeds we used to play with in the s suddenly became such a popular little culinary item? Try adding the rather tasteless chia seeds to your baked goods, oatmeal and smoothies. Another good and easy way to get more ALA into your daily diet is to add ground flaxseeds or flaxseed oil to your meals. Flaxseeds which must be ground for the body to use them are also relatively tasteless, but they contain plenty of high-quality, essential ALA for your body. ALA supplements â€" take or skip? It is beneficial for heart health, blood pressure regulation and mental health. However, caution should be taken if you have high blood triglycerides. Research shows that taking too much ALA in supplement form could keep triglyceride levels high. Omega-6 to omega-3 ratio. While both omega-6 and omega-3 fatty acids are essential to the body and crucial for optimal functioning, most researchers agree that an imbalance of the two fatty acids is problematic.

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A study in the journal Biomedicine and Pharmacotherapy found that most modern diets in the western world have a The researchers state that the ideal ratio it should be is much lower â€" between 4: There are a couple of ways to attain a more equitable ratio between omega-6 and omega-3 fatty acids. One suggestion is to eat less soybean oil and soy products. Limit your consumption of sunflower and canola oils as well. Olive oil, coconut oil and even butterfat are better options to lower the omega-6 to omega-3 fatty acid ratio in your diet. Another way to help balance the ratio is to consume more omega-3 rich foods. Chia seeds, flax seeds and flax seed oil are excellent choices. Molecularly distilled fish oil supplements can help too. Omega-3 and Omega-6 deficiencies. When people fail to get enough essential fatty acids in their diets, all sorts of disorders, illnesses and symptoms can arise. The liver and kidneys are affected negatively by omega-3 and omega-6 deficiency. Low levels of these nutrients can also cause depression, bipolar disorder, immune suppression and abnormal skin conditions. Benefits of Omega-3 and Omega-6 fatty acids. Optimal levels of omega-3 and omega-6 fatty acids have been associated with less menstrual pain, reduced risk of heart disease, less incidence of stroke, less joint pain and decreased risk of certain types of cancer. Consuming omega-3 and omega-6 fatty acids has also been shown to help improve mood disorders, psychological health and brain function. Responsible Supplementation We always recommend that you consult with a trusted health care practitioner as you discern what supplements are right for your particular needs. We have published up-to-date guides for each of the four human essential nutrients on our weblog. Our goal in writing these guides is to operate as a well-researched companion to help EFI readers navigate the waters of natural foods, supplements and optimal nutrition. Click the links below to read our essential nutrient guides:

Chapter 4 : Essential fatty acids and human brain.

Functions of essential fatty acids include improving immunity, cell signaling, mood and brain health, plus decreasing inflammation. Some research shows that increasing your intake of essential fatty acids could enhance mental and physical performance, help treat some diseases, promote mental health, and improve body composition.

The Vital Role of Essential Fatty Acids for Pregnant and Nursing Women John Finnegan Recently it has been discovered that the Omega-3 fats are necessary for the complete development of the human brain during pregnancy and the first two years of life. One also wonders whether the prevalence of infant and childhood illnesses like Epstein Barr; Candida albicans overgrowth; sinus allergies; chronic ear, nose, and throat infections; as well as so-called emotional disorders like hyperactivity and autistic behavior, also have their basis in nutritional deficiencies, particularly in the lack of Omega-3 fatty acids. Donald Rudin, in his excellent book The Omega-3 Phenomenon, states the issue succinctly: A well-nourished nursing mother provides her infant with a perfect blend of essential fatty acids and their long-chained derivatives, assuring the fast-growing brain and body tissues a rich supply. Here is a nutritive comparison: Breast milk may have five times more arachidonic acid and two and a half times more EPA eicosapentaenoic acid than formula. Breast milk may have 30 times more DHA docosahexaenoic acid than formula. Sadly, the breast milk of many mothers in our country reflects the high trans fatty acid and low Omega-3 content in the average diet. American mothers produce milk that often has only one-fifth to one-tenth of the Omega-3 content of the milk that well-nourished, nut-eating Nigerian mothers provide their infants. This discovery has far-reaching implications. The frightening news is that for the past three generations since the advent of refined oils , the vast majority of the population in North America has not been given adequate nourishment for complete brain development. The Omega-3 fats also aid in balancing the autoimmune system, and there seem to be a growing number of children with allergies, colic, and skin problems. There are also indications that Omega-3 fats play an ongoing role in brain function, healthy immune system function, and general growth throughout childhood and adolescence. One study revealed that Omega-3 supplementation induced catch-up growth in a deficient, underdeveloped seven-year-old. For these conservative researchers to include a message like this in their research paper should make us concerned for our future. These children now 3 and 6 years old are very bright and healthy and have been free from many health problems most young children now experience. A deficiency of the Omega-3 and Omega-6 fats causes insufficient milk production and breast engorgement. Flax seed oil has been found to substantially increase milk production in women who are not producing enough milk to nurse their infants. It also often clears up breast engorgement. One woman I know was having great difficulty producing enough milk to nurse her newborn child. Within twenty-four hours of taking flax seed oil, her milk production doubled, and one breast that was engorged opened up, allowing the milk to flow freely. Another paper worth reading is the report given by Artemis Simopoulos, M. Neither is baby formula. At a recent international symposium on Dietary Omega-3 and -6 Fatty acids Dr. Neuringer, an authority on infant milk, stated that the low Omega-3, high Omega-6 content in infant formulas is of great concern because of the imbalance it causes among the resultant prostaglandins. These imbalances could impair the immune system and predispose the infant to cancer and heart trouble later in life. Feeding a nonnursing baby a few drops of flax seed oil will provide the Omega-3 and Omega-6 essential fatty acids. The Health Protection Branch of the Canadian government, which is the equivalent of the American FDA, is considering requiring that all infant formulas contain adequate amounts of the Omega-3 fatty acids. Flax seed oil is the highest source of Omega-3 fatty acids, a good source of the Omega-6 fatty acids, and has no cholesterol. It is good tasting and can be poured directly onto protein dishes, vegetables, salads, grains, and soups. It is a very delicate oil and should not be used for cooking. Since most adults today are deficient in the Omega-3 fatty acids, nursing mothers may not have sufficient amounts to pass along to their infants. It is especially important, therefore, for pregnant and nursing women to supplement their diets with flax seed oil. Generational Consequences of

Deficiency There are many serious consequences of generation after generation having diets deficient in an element essential for normal development of the nervous system. Following are a few observations of the effects that inadequate nutrition is having on social and economic conditions today. A widespread alienation and pervasive depression in young people, truly alarming to observe in an age group usually known for its boundless enthusiasm and enjoyment of life. An increase in suicides and killings among young children, almost unheard of a generation ago. The ongoing increase in drug and alcohol abuse. An unparalleled growth of immune system disorders like Epstein Barr, Candida, allergies, chronic sinus and ear infections, and digestive disorders. A serious decline in the level of scholastic achievement among school children. A continued deterioration of the quality of goods produced by American industries. A nation of people that lives on hamburgers, french fries, milk shakes, cola drinks, TV dinners, and other toxic foods is destined to lose its competitive edge, and will continue to foster drug abuse in the workplace. Certainly, there are many social and economic factors contributing to this disturbing state. But there is also a great deal of sound scientific research that clearly demonstrates that, when populations are subjected to serious, continued nutritional deficiencies, the offspring of each successive generation shows an increased deterioration in physical and mental health. In his classic work, Nutrition and Physical Degeneration, Dr. Weston Price presents remarkable observations on the diets and health of different cultures around the world.. He has extensively documented the degeneration that occurs when healthy peoples, eating traditional diets, convert to modern foods. He was able to observe many cultures, living and eating as they had for thousands of years. When these people met the modern age and converted to modern diets, they experienced disastrous consequences to their physical and emotional health. He studied society after society, from Swiss farmers living in high Alpine valleys to Gaelics on islands of the outer Hebrides, from descendants of ancient civilizations living in Peru to the Maori in New Zealand, the Eskimos in Alaska, Indians in Canada and the United States, Melanesians and Polynesians in the South Pacific, Africans and Malay tribes on islands north of Australia. Again and again, he found the same story repeated. The indigenous peoples had strong, healthy bodies, free from cancer, heart disease, and immune system weakness. And surprisingly, tooth decay and cavities were almost nonexistent, despite the fact that these peoples usually had no dentists or fluoride toothpaste. He also met several doctors who told him that, in several decades of living among native peoples, they never saw a single case of cancer. John Finnegan, author, researcher and nutritional consultant, has spent twenty-six years studying and working in the holistic health field. Broda Barnes and Dr. John Christopher, and in several holistic medical centers.

Chapter 5 : EFAs (Essential Fatty Acids) Archives | Allergies & Your Gut

Imbalances in fats and essential fatty acids. Although a low-fat diet has typically been advised as healthy, and there are still plenty of "low-fat" foods being advertised and sold, current scientific evidence shows that low fat is not healthy, especially when it comes to mental health Kromhout, D. ().

The sequence is as follows. Serotonin is a neurotransmitter that is often deficient in the brains of depressed people. Boosting serotonin can alleviate depression in some people and reduce carbohydrate cravings in others, thus inducing weight loss. The blood-brain barrier does not allow significant absorption of serotonin from the blood. The brain does have a large neutral amino acid pump that freely allows tryptophan and 5-HT into the brain for conversion into serotonin. The process by which 5-H is converted into serotonin is called decarboxylation. If decarboxylation occurs before 5-HT is absorbed by the brain, than blood levels of serotonin will elevate significantly, but very little serotonin will enter the brain. When Europeans take 5-HT, they are often prescribed the dopa decarboxylase inhibitor carbidopa that prevents 5-HT from being converted into serotonin until it reaches the brain. Americans do not take carbidopa with 5-HT and the result is possible serotonin overload in the blood, with virtually no serotonin reaching the brain. We will describe later the dangers of overloading the blood with serotonin. Americans taking 5-HT are more vulnerable to blood serotonin overload because, unlike most Europeans who are vitamin deficient, Americans who use 5-HT usually take large doses of vitamin B6 as well. Vitamin B6 rapidly converts 5-HT into serotonin before it can reach the brain. Even when combined with carbidopa, high levels of vitamin B6 will break through the carbidopa barrier and insure that 5-HT converts into serotonin in the blood before the it can reach the brain. The multiple health benefits of vitamin B6 are too important, we believe, to recommend that people avoid taking vitamin B6 just to enable them to try using 5-HT to boost brain serotonin levels. This may be difficult anyway without also taking carbidopa, which is available in the US only as a prescription drug. At the very best, those who take vitamin B6 with 5-HT are probably wasting their money. Unfortunately, high serotonin in the blood in not benign. Here is the real frightening aspect of serotonin overload, as described by Dr. The effect can also be seen with dietary intake of only modest amounts of serotonin, and there has actually been described in the medical literature, a tribe of South Sea islanders with right heart fibrosis as a result of eating green banana mush, which poisons them with its serotonin content" Dr. Harris goes on to state that people who ingest several hundred milligrams a day of 5-HT with B6 and without a decarboxylase inhibitor would expect to see urinary excretion of a serotonin metabolite in the same range as a person with a serotonin secreting tumor. Carbidopa is a prescription drug. One Foundation analyst felt that 81 mg a day of aspirin and mg a day of magnesium would reduce the risk of 5-HT inducing a heart attack. Some people may not experience any blood serotonin increase, while others could suffer from a lethal serotonin peripheral overload. Based on the potential health risks of ingesting 5-HIT, Bio Recovery has decided not to offer it tat this time. This warning applies only to 5-hydroxy tryptophan 5-HT , not tryptophan itself. Published studies show that tryptophan does not readily convert into serotonin in the blood, but that 5-HT does, since 5-HT can convert directly into serotonin while tryptophan has to go through one additional metabolic step which protects against blood serotonin overload. A recent meta-analysis of its effectiveness was published in the British Medical Journal in Twenty-three double blind studies involving 1, patients were analyzed. The big advantage of using Hypericum instead of antidepressant drugs is its safety and lack of side effects. The standard dose is milligrams three times daily between meals. Do not use St. First see your doctor about discontinuing your drug. If you are still depressed after three weeks on the formula, you can use St. This creates a lot of extra serotonin in your brain. If alter four weeks on St. Tyrosine to Norepinephrine The amino acid tyrosine, found in large amounts in meats and cheeses, has an amazing effect on depression. A number of studies have found that it can succeed where antidepressant drugs fail. This chemical reaction causes the brain to race until the supply of norepinephrine is depleted. The crash leaves addicts exhausted, depressed, extremely irritable, and craving

more cocaine. Large doses of tyrosine can reduce withdrawal symptoms and prevent serious depression among cocaine addicts. We have used tyrosine at the Health Recovery Center for the past few years with no adverse effects. The usual dose is three to six grams per day, taken on an empty stomach. You must take vitamins B6 and to facilitate conversion of tyrosine to norepinephrine. L-Phenylalanine to Norepinephrine As an alternative to tyrosine, you can take the amino acid L-phenylalanine, which also can be converted into norepinephrine. In one, this potent ammo acid was found as effective an antidepressant as the drug imipramine Tofranil. L-phenylalanine has one important advantage over tyrosine treating depression. It can be converted to a substance called 2-phenylethylamine, or 2-PEA. Low brain levels of 2-PEA are responsible for some depression before it converts to tyrosine, which the converts to norepinephrine. If you are affected, L-phenylalanine will be better for you than tyrosine. The only way to find out is by trial and error. I recommend that you start by taking L-phenylalanine. The only other disadvantage to taking L-phenylalanine is its slight potential for raising blood pressure. There is also some evidence that excess L-phenylalanine can cause headaches, insomnia, and irritability. For these reasons, it is Important to start with a low dose. L-phenylalanine doses can range from milligrams to 1, milligrams daily taken on an empty stomach. The problem is the result of an inborn deficiency in omega-6 essential fatty acid EFA. Alcohol stimulates temporary production of PGE1 and lifts the depression. If you have been depressed since childhood, your introduction to alcohol was probably nothing short of miraculous. But this relief is short-lived. When you stop drinking, PGE1 levels fall again and depression returns. To banish it, you turn again to alcohol. Thus a deadly spiral begins toward alcoholism. During the last fifteen years, researchers have learned to restore normal PGE1 levels in alcoholics and eliminate both the depression and the need to drink for relief. I have seen some amazing recoveries from depression within three weeks of GLA treatment. Take the case of Colleen, a high school English teacher. In college, she drank alcohol for the first time and received the shock of her young life. Her world brightened in a way she had never before experienced. The effects lingered into the next day and then gloom closed in again. After experiencing the dramatic lift in her spirits, she was convinced that she had discovered a magic elixir in alcohol. In a short time she was drinking a few beers every day. The alcohol never failed to banish her depression. She needed to drink more and more to get the lift she sought. She also began to experience deep depressions in the days following heavy drinking. After college, she began teaching high school English. Controlling her depression with alcohol became a real balancing act. Eventually, her drinking came to the attention of her peers and her students. Colleen was appalled at the idea that she was a problem drinker. She decided to prove she could live without alcohol. The next ten years were some of the most miserable of her life. She joined AA and sought psychiatric help for her severe depression Sadly, no antidepressant drug relieved her misery. It was hard to keep teaching, hard to keep living. Her depression had reached the suicidal stage when she reasoned that alcohol could put an end to her despair. Predictably, her alcohol intake began to escalate rapidly. This time, no one sympathized. Her principal ordered her to treatment. Three weeks after completing an inpatient program, she was back at work and drinking again to medicate her depression. A second round of treatment left her temporarily dry and depressed. When she called the Health Recovery Center, she was crying: Within three weeks, her depression had vanished. She no longer needed nor craved alcohol. Although alcohol blocks production of additional amounts of this metabolite, its active effect is to enhance what little is available in the brain. Eventually, a no-win situation develops and alcohol becomes the only way to prevent depression. The solution, of course, is to provide the brain with the PGE1 needed to reverse the depression. The illustration below shows how essential fatty acids are converted into PGE1 and other brain metabolites. Zinc and magnesium needed for formation of gamma-linolenic acid GLA ; vitamin B6, for metabolism of cis-linolenic acid; and vitamin C, to increase production of PGE1. Colleen now uses this natural substance daily instead of alcohol, and her world has brightened up permanently.

Chapter 6 : Essential Fatty Acids and Mental Health - Nutrition

This article summarizes the peer-reviewed evidence base on the effects EFAs have on mental health. Essential Fatty Acids fatty acids, inflammation and immunity.

In humans, arachidonic acid This is illustrated by studies in vegans and vegetarians. This effect can be altered by changing the relative ratio of LA: ALA, but is more effective when total intake of polyunsaturated fatty acids is low. Many infant formulas have AA and DHA added to them with an aim to make them more equivalent to human milk. Essential nutrients are defined as those that cannot be synthesized de novo in sufficient quantities for normal physiological function. In the s Arild Hansen showed that in humans: It was characterized by an increased food intake, poor growth, and a scaly dermatitis, and was cured by the administration of corn oil. Later work by Hansen randomized children, mainly black, to four treatments: The infants who received the skimmed milk formula or the formula with coconut oil developed essential fatty acid deficiency signs and symptoms. They found that patients undergoing intravenous nutrition with glucose became isolated from their fat supplies and rapidly developed biochemical signs of essential fatty acid deficiency an increase in This could be treated by infusing lipids, and later studies showed that topical application of sunflower oil would also resolve the dermal symptoms. Arachidonic acid is the major precursor of prostaglandins , leukotrienes that play a vital role in cell signaling, and an endogenous cannabinoid anandamide. Particular fatty acids are still needed at critical life stages e. Conjugated fatty acids like calendic acid are not considered essential. Authoritative sources include the whole families, but generally only make dietary recommendations for LA and ALA with the exception of DHA for infants under the age of 6 months. Because the LC-PUFA are sometimes required, they may be considered conditionally essential fatty acids, or not essential to healthy adults. Essential fatty acids play a part in many metabolic processes , and there is evidence to suggest that low levels of essential fatty acids, or the wrong balance of types among the essential fatty acids, may be a factor in a number of illnesses, including osteoporosis. Some plant-based foods contain omega-3 in the form of alpha-linolenic acid ALA , which appears to have a modest benefit for cardiovascular health. This elongation of ALA is inefficient. Conversion to DHA is higher in women than in men; this is thought to reflect the need to provide DHA to the fetus and infant during pregnancy and breast feeding. Vegetable Lipids as Components of Functional Food lists notable vegetable sources of EFAs as well as commentary and an overview of the biosynthetic pathways involved. EFA content of vegetable sources varies with cultivation conditions.

Chapter 7 : Essential Fatty Acid Guide: What to Take and What to Skip - Exercises For Injuries

Recent research has drawn attention to the potential health benefits of essential fatty acids (EFAs). As a result, consumers should be aware of the role EFAs play in nutrition, health and disease, in order to make informed choices about their health care.

This article has been cited by other articles in PMC. Depression is more typically thought of as strictly biochemical-based or emotionally-rooted. On the contrary, nutrition can play a key role in the onset as well as severity and duration of depression. Many of the easily noticeable food patterns that precede depression are the same as those that occur during depression. These may include poor appetite, skipping meals, and a dominant desire for sweet foods. The most common mental disorders that are currently prevalent in numerous countries are depression, bipolar disorder, schizophrenia, and obsessive-compulsive disorder OCD. Such noncompliance is a common occurrence encountered by psychiatrists. An important point to remember here is that, such noncompliant patients who have mental disorders are at a higher risk for committing suicide or being institutionalized. In some cases, chronic use or higher doses may lead to drug toxicity, which may become life threatening to the patient. Although further research needs to be carried out to determine the best recommended doses of most nutritional supplements in the cases of certain nutrients, psychiatrists can recommend doses of dietary supplements based on previous and current efficacious studies and then adjust the doses based on the results obtained by closely observing the changes in the patient. They make poor food choices and selecting foods that might actually contribute to depression. Recent evidence suggests a link between low levels of serotonin and suicide. Depression is a disorder associated with major symptoms such as increased sadness and anxiety, loss of appetite, depressed mood, and a loss of interest in pleasurable activities. If there is no timely therapeutic intervention, this disorder can lead to varied consequences. Hence, tryptophan can induce sleep and tranquility. This implies restoring serotonin levels lead to diminished depression precipitated by serotonin deficiencies. Methionine combines with adenosine triphosphate ATP to produce S-adenosylmethionine SAM , which facilitates the production of neurotransmitters in the brain. Researchers attribute the decline in the consumption of omega-3 fatty acids from fish and other sources in most populations to an increasing trend in the incidence of major depression. Many of the proposed mechanisms of this conversion involve neurotransmitters. For instance, antidepressant effects may be due to bioconversion of EPA to leukotrienes, prostaglandins, and other chemicals required by the brain. Others hypothesize that both EPA and DHA influence neuronal signal transduction by activating peroxisomal proliferator-activated receptors PPARs , inhibiting G-proteins and protein kinase C, in addition to calcium, sodium, and potassium ion channels. Whichever may be the case, epidemiological data and clinical studies have clearly shown that omega-3 fatty acids can effectively treat depression. Nevertheless, doses of omega-3 higher than 3 g do not show better effects than placebos and may be contraindicative in cases, such as those taking anticlotting drugs. Previous research has revealed the link between nutritional deficiencies and some mental disorders. The significance of various nutrients in mental health, with special relevance to depression has been discussed below. In higher organisms human , they have been found to affect mood and behavior. Eating a meal which is rich in carbohydrates triggers the release of insulin in the body. Insulin helps let blood sugar into cells where it can be used for energy and simultaneously it triggers the entry of tryptophan to brain. Tryptophan in the brain affects the neurotransmitters levels. Consumption of diets low in carbohydrate tends to precipitate depression, since the production of brain chemicals serotonin and tryptophan that promote the feeling of well being, is triggered by carbohydrate rich foods. It is suggested that low glycemic index GI foods such as some fruits and vegetables, whole grains, pasta, etc. As many as 12 amino acids are manufactured in the body itself and remaining 8 essential amino acids have to be supplied through diet. A high quality protein diet contains all essential amino acids. Foods rich in high quality protein include meats, milk and other dairy products, and eggs. Plant proteins such as beans, peas, and grains may be low in one or two essential amino acids. Protein

intake and in turn the individual amino acids can affect the brain functioning and mental health. Many of the neurotransmitters in the brain are made from amino acids. The neurotransmitter dopamine is made from the amino acid tyrosine and the neurotransmitter serotonin is made from the tryptophan. The excessive buildup of amino acids may also lead to brain damage and mental retardation. For example, excessive buildup of phenylalanine in the individuals with disease called phenylketonuria can cause brain damage and mental retardation. Brain lipids, composed of fatty acids, are structural constituents of membranes. In one of the first experimental demonstrations of the effect of dietary substances nutrients on the structure and function of the brain, the omega-3 fatty acids specially alpha-linolenic acid, ALA were the member to take part. An important trend has been observed from the findings of some recent studies that lowering plasma cholesterol by diet and medications increases depression. Among the significant factors involved are the quantity and ratio of omega-6 and omega-3 polyunsaturated fatty acids PUFA that affect serum lipids and alter the biochemical and biophysical properties of cell membranes. Experimental studies have revealed that diets lacking omega-3 PUFA lead to considerable disturbance in neural function. During late gestation and the early postnatal period, neurodevelopment occurs at significantly rapid rates which make the supply of adequate quantity of PUFAs, particularly DHA, imperative to ensure neurite outgrowth in addition to appropriate development of brain and retina. These relationships may explain the inconsistency in the results of trials on cholesterol-lowering interventions and depression. On similar lines, dieting behaviors have been associated with alterations in moods. Their deficiency can accelerate cerebral aging by preventing the renewal of membranes. However, the respective roles of the vascular component on one hand where the omega-3s are active and the cerebral parenchyma itself on the other, have not yet been clearly resolved. The role of omegaâ€”3 in certain diseases such as dyslexia and autism is suggested. It was omegaâ€”3 fatty acids that participated in the first coherent experimental demonstration of the effect of dietary substances nutrients on the structure and function of the brain. Experiments were first of all carried out on x-vivo cultured brain cells 1 , then on in vivo brain cells 2 , finally on physicochemical, biochemical, physiological, neurosensory, and behavioral parameters 3. These findings indicated that the nature of polyunsaturated fatty acids in particular omegaâ€”3 present in formula milks for infants both premature and term determines the visual, cerebral, and intellectual abilities. According to a study reported in Neuropsychobiology,[42] supplementation of nine vitamins, 10 times in excess of normal recommended dietary allowance RDA for 1 year improved mood in both men and women. The interesting part was that these changes in mood after a year occurred even though the blood status of nine vitamins reached a plateau after 3 months. This mood improvement was particularly associated with improved vitamin B2 and B6 status. In women, baseline vitamin B1 status was linked with poor mood and an improvement in the same after 3 months was associated with improved mood. Thiamine is known to modulate cognitive performance particularly in the geriatric population. Supplementation with cobalamin enhances cerebral and cognitive functions in the elderly; it frequently promotes the functioning of factors related to the frontal lobe, in addition to the language function of people with cognitive disorders. Adolescents who have a borderline level of vitamin B12 deficiency develop signs of cognitive changes. A controlled study has been reported to have shown that mcg of folic acid enhanced the effectiveness of antidepressant medication. In addition to this, the SSRIs can also lower blood pressure in people, resulting in falls which may lead to broken bones. Indiscriminate prescription of SSRIs by doctors and ingestion by patients at risk of depression or other mental health problems may put them at increased risk of fractures. Compounded by the fact that they may be aging and already taking other medications, may also predispose them to osteoporosis. Iodine Iodine plays an important role in mental health. The iodine provided by the thyroid hormone ensures the energy metabolism of the cerebral cells. During pregnancy, the dietary reduction of iodine induces severe cerebral dysfunction, eventually leading to cretinism. Iron Iron is necessary for oxygenation and to produce energy in the cerebral parenchyma through cytochrome oxidase , and for the synthesis of neurotransmitters and myelin. Iron concentrations in the umbilical artery are critical during the development of the foetus, and in relation with the IQ in the child; Infantile anemia with its associated iron deficiency is associated with disturbance in the

development of cognitive functions. This gender difference starts in adolescence and becomes more pronounced among married women aged , with children. Furthermore, women of childbearing age experience more depression than during other times in their lives. These indicate the possible importance of iron in the etiology of depression since its deficiency is known to cause fatigue and depression. Iron deficiency anemia is associated, for instance, with apathy, depression, and rapid fatigue when exercising. The role of lithium has been well known in psychiatry. Half a century into its use, its choice for bipolar disorder with antimanic, antidepressant, and antisuicidal property. The therapeutic use of lithium also includes its usage as an augmenting agent in depression, scizoaffective disorder, aggression, impulse control disorder, eating disorders, ADDs, and in certain subsets of alcoholism. Lithium can be used in patients with cardiovascular, renal, endocrine, pulmonary, and dermatological comorbidity. The use of lithium during pregnancy and lactation, in pediatric and geriatric population needs careful observation about its toxicity. Selenium In a large review, Dr. David Benton of the university of Wales identified at least five studies, which indicate that low selenium intake is associated with lowered mood status. At least five studies have shown that zinc levels are lower in those with clinical depression. Several studies have revealed the full genetic potential of the child for physical development and mental development may be compromised due to deficiency even subclinical of micronutrients. When children and adolescents with poor nutritional status are exposed to alterations of mental and behavioral functions, they can be corrected by dietary measures, but only to certain extent. It has been observed that, nutrient composition of diet and meal pattern can have beneficial or adverse, immediate or long-term effects. Dietary deficiencies of antioxidants and nutrients trace elements, vitamins, and nonessential micronutrients such as polyphenols during aging may precipitate brain diseases, which may be due to failure for protective mechanism against free radicals. Anorexia of aging may play an important role in precipitating this, by either reducing food intake directly or reducing food intake in response to such adverse factors as age-associated reductions in sensory perception taste and smell , poor dentition, use of multiple prescription drugs, and depression. They suggest physiologic changes associated with aging, mental disorders such as dementia and depression, and medical, social, and environmental as causative factors. Currently to tackle the problem of depression, people are following the alternative and complementary medicine CAM interventions. CAM therapies are defined by the National Center for Complementary and Alternative Medicine as a group of diverse medical and health systems, practices, and products that are not currently considered to be a part of conventional medicine. Some clinicians judge these interventions to be attractive and safe alternatives, or adjuncts to conventional psychotropic medications. These findings may lead to greater acceptance of the therapeutic value of dietary intervention among health practitioners and health care providers addressing depression and other psychological disorders. The global burden of disease. Diagnostic and statistical manual of mental disorders. Nutritional therapies for mental disorders. Aggression, suicide and serotonin: Relationships to CSF amine metabolites. The varied clinical presentations of major depressive disorder. National Institute of Mental Health:

Chapter 8 : Omega-3 versus Omega-6 Fatty Acids | Allergies & Your Gut

Along with carbohydrates, protein, water, vitamins and minerals, fats are one of the 6 groups of essential nutrients for the human body. Yet many people avoid essential fatty acids and try to cut them out of their diet completely, causing a host of unnecessary health problems.

By Randi Fredricks, Ph. Read More Excess consumption of fat is one of the major causes of disease and premature death in modern societies. It is intimately associated with the current epidemic levels of cardiovascular disease, stroke, diabetes, and cancer of the breast, colon, and prostate. Though over-consumption of fats clearly presents us with serious health risks, certain types of fat are actually essential for maintaining optimum health. The proper diet for brain health needs quality of essential fatty acids. Essential fatty acids bring important nutrients into cells and keep harmful toxins out. In addition, essential fatty acids produce chemicals in the body that cause a healthy inflammatory response and maintain dilation of blood vessels. There are two main subtypes of fatty acids; the omega-3 and omega-6 fatty acids. Diets high in omega-3 fatty acids, found in deep-water fish, are associated with a decreased incidence of depression and suicide. Depression has been linked to omega-3 deficiency. Research has shown that EPA affects blood flow, hormones and the immune system, which in turn affects the brain. DHA is associated with the membranes of ion channels in the brain, making it easier for them to change shape and transit electrical signals. Numerous observational studies and uncontrolled trials have reported the benefits of fish oils and omega-3 fatty acids DHA and EPA may be particularly protective against depression. Depression is 60 times more common in New Zealand than in Japan, where the Japanese get far more omega-3 from these types of cold-water fish, which include bluefish, halibut, salmon, and tuna. Omega-3 is also found in nuts, whole grains, beans, and seeds A study from Ohio State University suggested that optimizing the ratio of omega-3 to omega-6 in the diet can alleviate the symptoms of depression. The investigators took blood samples from 43 older adults average age 67 , calculated PUFA levels, and established that people with high ratios of omega-6 to omega-3 were more likely to suffer from depression. Omega-6 essential fatty acids are found in a variety of oils including borage oil, evening primrose flax, hemp, safflower, sesame, and soybean. Some studies have suggested that essential acids may decrease the risk of suicide. Investigators in one study found low levels of DHA and a high ratio of omega-6 fatty acids to omega-3 fatty acids were associated with an increased risk of suicide in people with depression. A number of studies have indicated that depressed people have lower omega-3 fatty acid levels than people who are not depressed. Moreover, low levels of EPA have correlated with increased severity of depression. Research has shown supplementation of EPA can be beneficial in the treatment of depression when administered alone. A study at Haukeland University Hospital in Norway found that cod liver oil may reduce the incidence of depression for many people. Since dietary sources of PUFAs, such as cold-water fish, can be difficult for some people to get enough of, many people also take fish oil supplements. Psychosomatic Medicine Apr;69 3: Associations between cod liver oil use and symptoms of depression: The Hordaland Health Study. Journal of Affective Disorders ; Omega-3 polyunsaturated essential fatty acid status as a predictor of future suicide risk. American Journal of Psychiatry Jun; 6:

Chapter 9 : The Vital Role of Essential Fatty Acids for Pregnant and Nursing Women - OAWHealth

Research findings point out that an imbalance in the ratio of the EFAs, namely the omega-6 and omega-3 fatty acids, and/or a deficiency in omega-3 fatty acids, may be responsible for the heightened depressive symptoms associated with low plasma cholesterol.

Consumers are increasingly turning to natural health products to maintain or improve their health. Recent research has drawn attention to the potential health benefits of essential fatty acids EFAs. As a result, consumers should be aware of the role EFAs play in nutrition, health and disease, in order to make informed choices about their health care. They are also essential nutrients; sometimes called vitamin F. Essential nutrients are necessary for life, but must be obtained through diet because the body cannot make them. EFAs are required for the proper structure and function of every cell in the body, and are important for optimal health. EFAs increase the absorption of vitamins and minerals; nourish the skin, hair and nails; promote proper nerve functioning; help produce hormones; ensure normal growth and development; and prevent and treat disease. Fats fatty acids fall into two main groups â€" saturated and unsaturated â€" based on their chemistry. There are three major classes of unsaturated fatty acids: The omega-6s and omega-3s are essential. The omega-9s are non-essential because the body can make them from other fatty acids. Unsaturated fatty acids are further classified as either monounsaturated or polyunsaturated. However, the fatty acids derived from them are also generally considered essential. EFA deficiency is common today because of modern dietary and lifestyle choices, and environmental factors. EFA deficiency can eventually lead to disease and even death. See sidebar for symptoms of EFA deficiency. LA is abundant in the food supply and thus there is no need to supplement. GLA is present in small amounts in human breast milk and some foods, but the typical diet provides very little GLA. Found in high amounts in eggs, fish and meat, AA is abundant in the food supply and supplementation is not usually necessary. EFAs in the treatment and prevention of disease EFA deficiency has been identified in many diseases including mental disorders, diabetes, atherosclerosis, hypertension, eczema, PMS, immune dysfunction, and inflammatory conditions such as rheumatoid arthritis. EFAs may help improve these conditions, and EFA supplementation has been studied in hundreds of clinical trials. Heart disease Population studies have shown that a diet rich in ALA, EPA and DHA helps maintain a healthy heart and may protect against heart disease by reducing high blood lipids and blood pressure, and by decreasing blood clotting. Evidence supporting the benefits of EFAs for the the heart was so compelling that in October, the American Heart Association updated its dietary guidelines, recommending healthy adults consume at least two servings of fatty fish per week. At the same time, the U. Food and Drug Administration FDA , finding the evidence suggestive, but not conclusive, allowed a qualified claim linking omega-3 fatty acids to a reduction in the risk of coronary heart disease. Arthritis and other joint conditions GLA is converted to eicosanoids with potent anti-inflammatory properties. It also modulates the immune response, which can decrease joint inflammation and destruction. Placebo-controlled studies have demonstrated that supplementation with GLA may reduce the symptoms of rheumatoid arthritis in both children and adults. Reductions in the duration of morning stiffness, joint swelling, tenderness and pain have been noted. EFAs help alleviate dry, itchy, and inflamed skin and help reduce moisture loss. At least 22 randomized, placebo-controlled trials have been conducted, with the majority showing significant benefit. In several studies, patients taking GLA were able to reduce the use of drugs such as antibiotics, oral steroids and topical steroids. Mental disorders Although omega-3 EFAs are best known for their heart-protecting benefits, they may also play a role in mental health. Other health conditions Research using EFAs is underway in many other areas, including gastrointestinal disorders, diabetes, obesity, PMS, mastalgia breast tenderness , hypertension, multiple sclerosis, lupus, asthma, allergies and cancer. Recent human clinical trials done in the area of cancer, although preliminary in nature, are encouraging. GLA has demonstrated anticancer effects, both alone and in combination with drug therapy, such as tamoxifen. Other areas of research include supplementation during pregnancy and

breastfeeding, and for infants and young children. Suggested EFA Requirements Because the typical North American diet is substantially different from the diet of our ancestors more trans and saturated fats, less EFA-containing seeds, berries and fish and because so many other factors interfere with fatty acid metabolism, most diets may not contain sufficient EFAs. Unfortunately, the exact requirements for individual EFAs are not clearly defined, despite the large volume of literature available on the subject. In , an international working group of scientists met at the National Institute of Health in Bethesda, Maryland to discuss dietary recommendations for EFAs. Although they concluded that there was insufficient scientific evidence to establish Dietary Reference Intakes DRIs , there was enough data to establish Adequate Intake AI recommendations for adults. Based on a daily kcal diet, their recommended daily AI was defined as 4. The working group also recognized that there is too much trans fat in the food supply, and recommended an upper limit of 2 grams per day. Side effects of EFA supplementation EFAs can be consumed in large amounts as much as 50 grams per day with no serious side effects. Occasional minor side effects may include stomach upset, burping, flatulence, soft stools and diarrhea. These side effects often lessen with continued use and occur more often at higher doses. To minimize side effects, consume with food, start with smaller doses, and increase the dose gradually over several weeks. Persons on anticoagulant or blood thinning medications should consult a health care practitioner before taking EFA supplements from fish since they can thin the blood. While more research is needed on the role of EFAs in specific diseases, it is clear most individuals can benefit from EFA supplementation to maintain optimal health and nutrition. There is also strong evidence that EFAs can help prevent or treat specific health conditions. Furthermore, they are safe and well tolerated, and readily available wherever health supplements are sold. Consult your health care practitioner or the resource guide in this booklet for more information.