

BeGood Supplements Advanced MicroNutrient Drops
December 17, 2018



RESEARCH PAPER
A study on the effect of micronutrients on the human body

Dr. Nevena Vidovic Kardum
Institute for Medical Research, University of Belgrade · Centre of Research Excellence
in Nutrition and Metabolism



In order to ensure proper functioning of our body, each of its parts including the smallest units – cells must have proper nutrition. Besides macronutrients– carbohydrates, fats and proteins, which are the main source of energy (calories), our body requires many other elements called micronutrients. The most important micronutrients include vitamins, minerals, and trace minerals, amino and organic acids. Although micronutrients are needed in tiny quantities, their role in the human body is of vast importance. Unfortunately nowadays, the hectic way of life has led to progressive decline in diet quality and increase in stress. People are turning to diets that are energy dense (i.e. rich in fats and sugars), but that confer little or not at all micronutrients. This leads to the progressive increase in the proportion of the population that is deficient in micronutrients. Furthermore, it correlates that an increase in the incidence of wide ranges of chronic diseases, such as cardio-metabolic, inflammation, neurological diseases and cancer as well. In order to improve our health and prevent the development of serious diseases, we need to obtain all the valuable (trace) minerals and other micronutrients our body requires for its optimal functioning.

The homeostasis of micronutrients inside the body is crucial for maintaining a **healthy immune system**. Particularly with aging, many functions of the immune system decline which leads to the increased risk of infections and associated mortalities and morbidities. Dysregulation in immune functions have been linked to poor nutrition, malnutrition and inadequate intake of micronutrients and minerals. Deficiencies in multiple micronutrients affect functions of the immune system more intensively than a single micronutrient deficiency. This is why natural a professional grade nutritional supplement as BeGood's Advanced MicroNutrient Drops are vital to take daily because they contain a myriad of all the needed minerals, trace elements, micronutrients and organic acids that a human body requires to protect against age related health conditions and diseases.

It is important to provide our body with all the essential elements that it cannot synthesize or loses due to ageing. By this, we could not only improve our health, but also prevent the occurrence of **age-related conditions and diseases**, or at least delay their progression. These include a weakened immune system, increased inflammation, low energy level, pain and arthritis in the body among others. By nutrition, it is almost impossible to provide adequate intake of all the needed micronutrients especially at once. Thus, supplementation seems to be necessary. Although there is a lack of clinical trials in humans, or animal feeding studies indicating benefits of complex supplements, data on individual trace minerals and micronutrients are quite promising.

Scientific literature underlines particular importance of three micronutrients, which are zinc, selenium and iron and are all-present in BeGood's Advanced MicroNutrients Drops. Zinc is the second most abundant trace element in the human body, followed by iron. Its deficiency is very common – affecting one third of the world's population– especially in developing parts of the world.¹ Zinc acts beneficially on the human immune system, including both innate and adaptive (acquired) immunity. The cells of the innate immunity are responsible for the elimination of invading pathogens. Zinc deficiency has been associated with impaired phagocytosis – major mechanism for eliminating pathogen), as well as the impaired activity of natural killer cells (cytotoxic lymphocytes that are crucial part of the innate immune system). Zinc is also important for the adaptive, i.e. acquired immune system. Its deficiency leads to the decreased number and function of circulating T lymphocytes. T lymphocytes or just T cells are subtype of white blood cells and part of the

adaptive immune system with a crucial role in cell-mediated immunity. The process of acquired immune system represents the basis of vaccination. One clinical study indicated benefits of zinc supplementation in young children receiving inactivated cholera vaccine. The children in Bangladesh were given vaccine alone or in combination with zinc supplementation. The results revealed enhanced immune response (response of T lymphocytes) in children taking zinc supplement.² Another study investigated the impact of zinc supplementation in HIV-infected patients in terms of their immunological response. In comparison with the placebo, zinc significantly increased the number of T helper cells (subtype of T lymphocytes) that regulate adaptive immune response and activate other immune cells.³

A number of scientific review papers have linked iron and selenium with the improved functions of immune system and defense from infections. Beneficial effects of iron are associated with its effects on proliferation of T lymphocytes, while selenium enhances immunity by decreasing the level of oxidative **stress**, since it is an important cofactor of antioxidant enzymes. ⁴ Oxidative stress is a condition which occurs when our body cannot deal with the production of free radicals. In other words, it represents the state in which antioxidant defense is not strong enough to neutralize all the toxic products of oxygen (also called reactive oxygen species). Selenium is a cofactor of the body's most important antioxidant enzymes, and its adequate intake is crucial for dealing with oxidative stress. A human intervention study questioned the impact of a three months long intake of dietary selenium on immune functions. The results revealed immune-enhancing properties based on increased activation and proliferation of B lymphocytes. B lymphocytes are also subtype of white blood cells that represent important part of humoral immunity, as part of the adaptive immune system. They secrete antibodies, i.e. immunoglobulins in response to various antigens. ⁵ Due to their evident role in boosting both innate and adaptive immunity, trace minerals and micronutrients can protect us from various infections, including flu and cold.

Deficiency in micronutrients, i.e. trace minerals has been associated with the enhanced **inflammatory processes** in the body. Chronic low-grade inflammation that persists in our body for a while has numerous deleterious consequences. It is implicated in the pathogenesis and progression of abdominal obesity and associated metabolic diseases (metabolic syndrome and type 2 diabetes), and many other conditions. While low concentrations of micronutrients increase the release of pro-inflammatory substances (called cytokines), higher levels of micronutrients almost completely abrogate their release. The reduced levels of some trace minerals (such as selenium for instance) have been associated with the severe inflammatory responses, high levels of C reactive protein (the blood biomarker of inflammation) and even sepsis.⁶

Since micronutrients express anti-inflammatory properties, there is a general interest in their use as dietary modulators in control of inflammation and **inflammation related diseases, such as arthritis**. There is an evident role of trace elements in the pathogenesis of both rheumatoid arthritis and osteoarthritis. A group of researchers investigated the concentrations of trace minerals (selenium, zinc, copper, iron) in blood and synovial fluid of both patients with rheumatoid arthritis/osteoarthritis and healthy control subjects. They observed variations in the levels of trace elements and their relative ratios in patients, compared with the healthy subjects. The most striking result was for the selenium level, which was lower in both synovial fluid and blood of the patients.⁷ The role of selenium in humans with rheumatoid arthritis was questioned in another human trial. This study indicated beneficial effects of selenium supplementation in alleviating morning stiffness

and articular pain (i.e. pain in joints), two of the most severe symptoms, which people with arthritis are dealing with.⁸ Effects of supplementation with mixture of trace minerals on the immune system and inflammation were tested in an animal study. More precisely, trace minerals were given for one month to cows during late pregnancy. The postnatal impact on calves was monitored. As results showed, maternal supplementation led to significant regulation of inflammation in calves, manifested by decrease in expression of inflammation-related genes.⁹ This study, thus, indicated importance of trace minerals and other micronutrients in pregnancy, since they intake may bring benefits to newborns.

Due to their anti-inflammatory properties, trace minerals/micronutrients are efficient in reducing **swelling** (edema). As one study showed, both oral and subcutaneous administration of zinc supplement reduced the edema and acted anti-inflammatory in experimental animals with acute and chronic inflammation.¹⁰ Furthermore, one literature review indicated that free-radicals scavengers, such as micronutrients, and selenium specifically, may reduce edema/swelling as shown on the lymphedema example.¹¹

Trace minerals are effective in dealing with chronic and persistent **pain**. Chronic pain is often defined as pain persisting for more than 3 months, but it can last for much more. It affects quality of life and impairs not only physical, but mental health as well. As literature suggest, there is an inverse relationship between the blood status (concentrations) of trace minerals and intensity of pain associated with various diseases (such as fibromyalgia for instance). This means less minerals in the body, greater the pain intensity. According to scientific findings, trace elements (mostly metals) can regulate the sense of pain by acting on ion channels which are involved in pain pathways inside the body. More precisely, these channels facilitate the transmission of nerve signals from pain sensors (in periphery) to the pain processing parts in the brain.¹²

Furthermore, a randomized clinical trial investigated the impact of liquid formula (rich in micronutrients, including iodine and selenium) on cyclic breast pain (mastalgia) associated with fibrocystic changes in breasts. Consumption of this micronutrients-containing formula led to significant decrease in the score of breast pain. Also, women taking this formula had lower rate of pain medications intake in comparison with the women from control group, who were taking placebo.¹³ This means taking needed minerals and micronutrients in general can decrease the need for pain tranquilizers, i.e. analgesics - and that's not all. As animal study showed, trace elements can improve pain-relief effects of analgesic drugs. Mice were given analgesic drug alone or in combination with trace elements (including zinc, manganese and magnesium in the greatest amounts) before pain inducing tests (tail-flick and hot-plate). Compared to the administration of analgesic drugs only, co-administration of trace minerals led to greater pain decline, with an increase in pain inhibition of 30%. These are promising findings since they confirm that the administration of trace minerals could decrease the amounts of drugs needed for the pain relief.¹⁴

Besides their role in alleviating symptoms of diseases, micronutrients can also help in the prevention of pathological conditions. Trace minerals have been associated with the decreased risk of developing different types of **cancer**. This is because trace minerals/micronutrients ensure adequate nutrition of the cells, and reduce the chance of their mutation, i.e. transformation into malignant cells. A very recent scientific review analyzed the association between dietary intake of trace elements and risk of esophageal cancer, a frequent

form of cancer. The findings indicated that increased intake of trace minerals, particularly iron and zinc associates with significant decrease in the risk of esophageal cancer.¹⁵ Epidemiological and experimental studies have indicated that trace elements (such as selenium) can act protectively on cellular system and, thus, prevent differentiation and proliferation of cancer cells.¹⁶ By supporting and regulating cellular health, including redox homeostasis and inflammatory pathways, micronutrients may prevent cell mutation and cancer initiation at the first place.

Many **athletes** are using supplements as BeGood's Advanced MicroNutrient Drops (AMD) as part of their daily routine and training, in order to compensate for the loss of electrolytes and to enhance their athletic performance while recovering from intense exercise. Trace minerals and micronutrients in general bring many benefits for professional athletes and fitness enthusiasts. For instance, calcium is required for maintenance of bone density, magnesium for prevention of muscle cramps and a healthy heart, while iron is particularly important to females, which tend to be iron depleted. Thus, the combination of these and many other required minerals, micronutrients and organic acids (as BeGood's Advanced MicroNutrients Drops) makes more than a perfect product for professional athletes. Due to the heavy schedule of training and competition, professional athletes are prone to immunosuppression and opportunistic infections.¹⁷ Weaken immune system is another reason besides enhancing the performance and promoting recovery which is why athletes consume minerals and micronutrients that boost immunity.

Iron is extremely important for female athletes, since its deficiency may have negative effects of athletic performance. More precisely, iron deficiency may decrease the aerobic capacity, postpone the recovery from exercise and increase heart rate.¹⁸ Thus, taking a quality supplement, which contains iron among other micronutrients, can reverse all these processes and **enhance athletic performance**, especially in deficient subjects. As a randomized, double blind placebo controlled trial showed, iron supplementation increased **resistance to fatigue** during knee extensor exercise in young women. In other words, iron supplementation decreased muscle fatigue and increased stamina.¹⁹ Another trial, in female iron-depleted rowers, showed that iron intake, in comparison with the placebo, improved energetic efficiency, i.e. maximized the benefits of training. Also, iron supplementation **decreased lactate response** during 4-km test trial in comparison with the control (placebo).²⁰ Lactic acid is a byproduct of physical activity, and the concentrations of its salts, i.e. lactates are increased in muscles as the exercise intensity increases. The level of lactates in the blood reflects their levels in the muscles. Too much lactic acid in the muscles makes them feel sore. Thus, micronutrients (as shown in mentioned study for iron), by regulating lactate response and help alleviating muscle soreness by promoting recovery from exercise.

A human trial investigated the blood concentrations of zinc in elite athletes and compared them with the blood levels of sedentary subjects. A total of thirty healthy subjects aged 18 to 27 years were enrolled. One group consisted of sedentary volunteers and the other group included weight lifters who exercised regularly. Comparison of blood zinc levels showed significantly higher values in sedentary subjects, indicating the extra need for zinc in athletes.²¹

A human intervention study investigated the impact of multi-nutrient supplementation on exercise performance in strength trained athletes. The participants took the supplement containing essential amino

acids as active ingredients (as those present in Be Good's Advanced MicroNutrients Drops) or placebo 15 minutes before exercise during the exercise and immediately post-exercise. The exercise protocol consisted of lower body resistance exercise sessions. In comparison with the placebo, amino acids contained in the supplement improved **exercise performance** (and endurance) and decreased **muscle damage** in strength trained athletes.²² Amino acids are important not only for the muscles but for the proper functioning of whole body as well. They are main units of proteins and some of them are essential, meaning our body cannot synthesize them and we need to take them from the diet and/or supplements.

A group of researchers conducted an interesting trial in which they measured the levels of minerals (calcium, phosphorus, sodium, potassium, zinc, selenium, manganese, iron, copper, cobalt) in urine samples obtained from subjects undergoing mountain an ultra-marathon. Immediately after the race the levels of minerals increased, while many of them recovered 24 hours post-race and some continued to increase (calcium, phosphorus, sodium). This study indicated alterations of physiologically relevant to minerals during running, and showed that some of these high quality minerals are quite important for the **recovery process**.²³ This study showed that minerals are lost in urine during prolonged running. Also, when we exercise we lose minerals and micronutrients via sweating. Thus, it is important to restore lost minerals post-exercise, by taking a high quality trace mineral supplement (such as BeGood's Advanced MicroNutrient Drops) that contains all the important elements.

Minerals and micronutrients are important for **sleep quality**. This is because they affect excitatory and inhibitory neurons and can determine one's sleeping pattern. A scientific review of available studies clearly indicated positive association between the levels of iron, magnesium, zinc and sleep duration. This means, the more of these minerals we have in our body, the longer we sleep.²⁴ Furthermore, the lack of calcium has been associated with the lack of sleep which can progress to complete insomnia. This is due to the role of calcium dependent channels in sleep regulation. Namely, impairment in these channels functioning leads to the decrease in sleep duration. A human study confirmed this, by showing that the use of calcium channel blockers, often prescribed in the treatment of hypertension, associate with the reduction in sleep duration and sleep efficiency.²⁵ Magnesium is also very important for proper sleep quality. As animal studies confirmed, levels of magnesium in some brain parts can affect the way we sleep.²⁶ Human studies have also indicated the importance of magnesium in sleep regulation. They have shown that intake of magnesium improves sleep quality but also reduces the levels of inflammation and oxidative stress. Also, this improvement in sleep quality was accompanied with the improvement in overall quality of life.²⁷ Another mechanism by which magnesium ensures restful sleep is by fighting against nocturnal leg cramps, which often disturb and interrupt our sleeping.²⁹

Micronutrients make an important part of central nervous system. More precisely, they stimulate development and differentiation of nerve cells. Intake of micronutrients is of great importance for **brain functioning**. We should specifically take care of adequate intake of micronutrients, such as calcium, iodine, iron, copper, among others micronutrients (and all of these are present in BeGood's Advanced MicroNutrient drops), as they ensure development and maintenance of brain structure and functions.³⁰ Selenium is a trace mineral of particular importance for the brain. It makes a part of selenoproteins which regulate various brain functions, including cognition, memory, motoric performance, and coordination. Also, selenium enhances

antioxidant defense of the brain and can be beneficial in prevention of oxidative stress – associated disorder, such as **age-related diseases** including dementia, sclerosis, Alzheimer, and Parkinson, diseases.³¹ Since brain oxidative stress leads to cognitive decline, selenium as a cofactor of important antioxidant enzymes can enhance antioxidant defense in brain and reverse this process. Authors of an interesting study investigated the correlation between blood selenium levels in the French elderly and decline in cognitive functions over time. They followed up study participants for almost ten years and found positive association between cognitive decline and decline in selenium levels. In other words, the greater the drop in selenium concentration was, the greater the probability of cognitive decline. Thus, selenium status, among other micronutrients, should be maintained in ageing people in order to improve cognitive functions.³² Besides selenium, zinc is also important mineral for ensuring adequate function of brain antioxidants. Among other minerals, manganese and copper, also participate in enzymatic mechanisms which protect against free radicals, and thus, reduce oxidative **stress** level.³³

Ageing is characterized with the decline in cells ability to maintain their functions and genome (DNA material) stable. Lifespan can be modulated by the balanced intake of macro and micronutrients, which could **slow down** the DNA damage, and consequently, postpone (slow down) the **ageing** process.³⁴ Micronutrients, acting as already mentioned above can reduce the oxidative stress associated with ageing, and, thus, ensure prolonged healthy ageing.

Researchers have shown that trace minerals can also improve visual function associated with age-related macular degeneration. Macular degeneration represents one of the greatest causes of vision loss, affecting more individuals than glaucoma and cataract together. A human intervention study questioned the impact of zinc supplementation on visual function (measured as visual acuity, contrast sensitivity) in subjects with this condition. The supplementation resulted in increase in macular pigmentation and visual function, suggesting beneficial effects of zinc (among other micronutrients) on **eye health**.³⁵ Another review study indicated the importance of zinc in regulation of retinal metabolism, which brings benefits to macular degeneration (since this condition is characterized with deterioration of retina). Also, this review pointed out the importance of selenium in improving eye health, due to its antioxidant role.³⁶

Trace minerals also have another important role– that is participation in wound healing and ensuring healthy looking skin. As animal study confirmed, supplementation with mix of trace minerals and amino acids (similar to the mix present in BeGood's Advanced MicroNutrient Drops) improved **wound healing**, caused by dermatitis. Also, this supplement promoted synthesis of skin collagen and, thus, contributed to **healthier skin**.³⁷ The lack of micronutrients, including zinc, iron, magnesium, copper, and selenium has been associated with the alopecia, which is a type of immune-mediated hair loss. This is not surprising considering the evident role of micronutrients in the regulation of immune cell functions. Furthermore, micronutrients participate in the development of normal hair follicle. Finally, trace minerals and micronutrients in general help fighting against oxidative **stress**, which is another way how they can ensure healthy looking skin and hair.³⁸

Trace minerals, micronutrients and organic acids, like calcium, zinc, manganese and copper, are essential for many physiological processes, including those implicated in the regulation of **bone health**. These elements via various pathways contribute to the bone density and strength. Homeostasis of calcium, for

instance, is importance for the right regulation of **bone metabolism and density**. Copper, on the other side, ensures elasticity and strength of the bones, by participating in crosslinking of elastin and collagen. Manganese represents important cofactor of bone cartilage formation. Thus, the deficiency in this element may lead to a smaller size of the bones. Zinc is also an essential cofactor of various enzymes that regulate bone formation, as well as bone calcification.³⁹ As a scientific review indicated, besides calcium, zinc, manganese and copper, other elements such as magnesium, iron, fluoride, selenium and boron, are important for bone health.⁴⁰ Magnesium is important for the skeleton strength. It is also a cofactor of enzyme that regulate metabolism of calcium and vitamin D, which are well recognized for their role in bone formation and health. Magnesium deficiency associates with the bone disorders. As one study in young swimmers showed, magnesium intake is an independent predictive factor of bone density. Namely, this study evaluated bone density in elite swimmers along with their energy and nutrient/micronutrient intake. The authors found that after adjusting for energy, vitamin D, calcium and phosphorus intake, magnesium intake remained significant predictor of bone mineral density.⁴¹ Iron is another element important for bone health, since it acts as a cofactor of enzymes that are involved in the bone matrix synthesis and the formation of active forms of vitamin D which stimulate intestinal absorption of calcium.⁴⁰ Furthermore, fluoride has beneficial effects on bone mass, and, together with calcium, it reduces the risk of fractures and improves the bone density of the spine. Selenium and boron are also elements that may have beneficial effects on bone health and homeostasis. Their deficiency may lead to growth retardation and defects in skeleton development.⁴⁰

Diet is an important factor that determines the composition and functions of microbiome in gastrointestinal tract. Gut microbiome contains tens of trillions of microorganisms and it is considered as a separate organism inside of our body. A healthy and balanced gut microbiome is of vast importance, not only for the proper digestion and health of digestive tract but for the systematic brain health as well. Besides macronutrients, micronutrients and trace minerals represent an important factor that determine the composition and functioning of gut microbiome. Diet poor in micronutrients associate with the poor composition of digestive microbiome. Poor microbial diversity in gastrointestinal tract associates with numerous metabolic and immune disorders. Scientists have confirmed the importance of micronutrients in restoring balanced gut micorbiome. As one animal study reported, six (6) weeks long supplementation with functional food enriched with calcium and magnesium particularly, but also with 70 other trace elements, led to significant increase in diversity of gut microbiota and thus ensured healthy gut microbiome.⁴²

Taking all above mentioned facts and scientific findings, BeGood's Advanced MicroNutrient Drops is certainly a product that confers multiple health benefits not only to healthy adults who wish to improve their cellular nutrition but also to physically active subjects and athletes who seek for a natural way to boost their performance including ageing people who are dealing with numerous changes inside their bodies such as a weakened immune system and increased inflammation. The great advantage of this product is the presence of not one or two but more than 70 minerals, 30 organic acids and trace elements.

Fulvic acid confers multiple health benefits. It represents a class of different molecules, known as humic substances that are made by organic degradation of plant and animal residues. Benefits of fulvic acid molecules have been recognized for than a thousand years. Thus, these molecules have been used in traditional medicine of India as immunomodulators (molecules that modulate immune functions in a good way)

and antioxidants. Also, fulvic acid molecules bring benefits to skin health and wound healing, acting as antiseptic and analgesic. **Antioxidant** potential of fulvic acid molecules is based on their ability to decrease level of lipid peroxidation (oxidative degradation of lipids) by increasing the activity of antioxidant enzymes. Also, fulvic acid molecules act beneficially on cells and their functioning. They are able to decrease the cellular release of pro-inflammatory molecules, and thus, decrease the extent of inflammation in the body and combat inflammation-related diseases.⁴³ These benefits have been confirmed in a human trial that questioned the impact of fulvic acid intake on the efficacy of eczema treatment. Participants with eczema were randomized to receive either fulvic acid product or placebo for 4 weeks. As a result, fulvic acid improved the symptoms of this inflammatory condition and reduced the erythema (redness of the skin). This study indicated benefits of fulvic acid molecules for skin health.⁴⁴ Fulvic acid molecules have another great quality – they express ability to promote the **transport of nutrients into the tissues**. Fulvic acid acts as carrier of minerals/micronutrients and promotes their absorption and uptake by the cells and tissues, but it also helps in **detoxification**, i.e. removing toxic products from the body. Toxic products refer to all the substances that our body does not need for its functioning and that actually can impair its functioning. Removing toxins is of vast importance for ensuring healthy cells and the whole body as well. Fulvic acid molecules can also enhance the recovery of injured muscles as well as the blood capacity of oxygen carrying. Meaning, fulvic acid ensures more oxygen to the cells and tissues. The more oxygen in the cells, more **energy**, and less tiredness and weakness.⁴⁵ More oxygen to the brain cells specifically means **clearer thinking**, i.e. improved **mental clarity** and less chance of dementia.

In recent times, another product has become popular for its potential use in dealing with chronic pain. This is medical cannabis, i.e. medical cannabis oil. The main active ingredients of cannabis (such as cannabidiol-CBD) act on excitatory and inhibitory neurotransmitters by modulating their effects which can lead to muscle relaxation and relief of pain. This is why researchers have questioned the impact of cannabis oil on the sense of pain in different conditions. CBD can be extracted with oils that are used as carriers, in order to produce CBD oil, with no psychogenic effects but with many health benefits. A group of researchers investigated the impact of CBD containing product (applied as spray) on the pain management in people with rheumatoid arthritis. Five weeks of treatment resulted in significant improvement in pain score associated with movement when compared to placebo.⁴⁶ Cancer patients are often not responding to the pharmacological analgesics, so they are seeking an alternative treatment. It seems like CBD oil may be a good solution for dealing with chronic and neuropathic pain associated with cancer. In their recent publication, a group of authors reviewed all the available evidence on use of CBD in cancer pain management. They have summarized that the evidence from the clinical studies conducted in the time frame of 1975 to 2017 in cancer patients concluded, CBD is can be efficient in reducing pain in people dealing with advanced cancer. Still, the authors underlined the limitations of the research and pointed out the need for more clinical trials that would provide more information on the dosage of the efficient CBD based therapy.⁴⁷ Besides pain management, CBD oil seem to be good therapeutic strategy for attenuating oxidative stress and inflammation, which are implicated in many chronic diseases. Scientists believe that CBD can target inflammation related signaling pathways inside the body, as well as to decrease oxidative stress by declining the production of reactive oxygen species (i.e. free radicals).⁴⁸



Despite the evident role of CBD in dealing with pain and inflammation, which are also health benefits of BeGood's Advanced MicroNutrient Drops, these two products should not be confused. First of all, BeGood's Advanced MicroNutrient Drops contain much more than just a single ingredient and thus brings a myriad of many health benefits to the human body than just pain and inflammation relief. Secondly, this BeGood's Advanced MicroNutrient Drops addresses the problem of today's diet and the lack of minerals and micronutrients that the human body is deficient. Besides minerals and trace elements, the drops provide essential amino acids and organic acids such as fulvic, trace minerals and trace elements that have wealth health benefits to the human body. CBD's do not address mineral deficiency, which exists in our food supply chain (even organically grown crops). There is research on fulvic, minerals and organic acids as a delivery agent for nutrient absorption. There are references, which addresses the value of these minerals, which indicate their action/function as a natural antibiotic from, research studies.

References:

- 1- Gammoh NZ, Rink L. Zinc in Infection and Inflammation. *Nutrients*. 2017;9(6). pii: E624. <https://www.ncbi.nlm.nih.gov/pubmed/28629136>
- 2- Ahmed T, Arifuzzaman M, Lebens M, Qadri F, Lundgren A. CD4+ T-cell responses to an oral inactivated cholera vaccine in young children in a cholera endemic country and the enhancing effect of zinc supplementation. *Vaccine*. 2009;28(2):422-9 <https://www.ncbi.nlm.nih.gov/pubmed/19837094>
- 3- Asdamongkol N, Phanachet P, Sungkanuparph S. Low plasma zinc levels and immunological responses to zinc supplementation in HIV-infected patients with immunological discordance after antiretroviral therapy. *Jpn J Infect Dis*. 2013;66(6):469-74. <https://www.ncbi.nlm.nih.gov/pubmed/24270132>
- 4- Calder PC. Feeding the immune system. *Proc Nutr Soc*. 2013;72(3):299-309 <https://www.ncbi.nlm.nih.gov/pubmed/23688939>
- 5- Hawkes WC, Kelley DS, Taylor PC. The effects of dietary selenium on the immune system in healthy men. *Biol Trace Elem Res*. 2001;81(3):189-213 <https://www.ncbi.nlm.nih.gov/pubmed/11575678>
- 6- Dawson DR 3rd, et al. Dietary modulation of the inflammatory cascade. *Periodontol 2000*. 2014;64(1):161-97. <https://www.ncbi.nlm.nih.gov/pubmed/24320963>
- 7- Yazar M, Sarban S, Kocyigit A, Isikan UE. Synovial fluid and plasma selenium, copper, zinc, and iron concentrations in patients with rheumatoid arthritis and osteoarthritis. *Biol Trace Elem Res*. 2005;106(2):123-32.
- 8- Aaseth J, Haugen M, Førre O. Rheumatoid arthritis and metal compounds--perspectives on the role of oxygen radical detoxification. *Analyst*. 1998 Jan;123(1):3-6. Review
- 9- Jacometo CB, et al. Maternal consumption of organic trace minerals alters calf systemic and neutrophil mRNA and microRNA indicators of inflammation and oxidative stress. *J Dairy Sci*. 2015;98(11):7717-29. <https://www.ncbi.nlm.nih.gov/pubmed/26319761>
- 10- Abou-Mohamed G, el-Kashef HA, Salem HA, Elmazar MM. Effect of zinc on the anti-inflammatory and ulcerogenic activities of indometacin and diclofenac. *Pharmacology*. 1995;50(4):266-72.
- 11- Bruns F, Micke O, Bremer M. Current status of selenium and other treatments for secondary lymphedema. *J Support Oncol*. 2003;1(2):121-30. <https://www.ncbi.nlm.nih.gov/pubmed/15352655>
- 12- Evans JG, Todorovic SM. Redox and trace metal regulation of ion channels in the pain pathway. *Biochem J*. 2015;470(3):275-80 <https://www.ncbi.nlm.nih.gov/pubmed/26341484>
- 13- Mansel RE, et al. A Randomized Controlled Multicenter Trial of an Investigational Liquid Nutritional Formula in Women with Cyclic Breast Pain Associated with Fibrocystic Breast Changes. *J Womens Health (Larchmt)*. 2018;27(3):333-340 <https://www.ncbi.nlm.nih.gov/pubmed/29237134>
- 14- Alexa T, Marza A, Voloseniuc T, Tamba B. Enhanced analgesic effects of tramadol and common trace element coadministration in mice. *J Neurosci Res*. 2015;93(10):1534-41. <https://www.ncbi.nlm.nih.gov/pubmed/26078209>
- 15- Ma J, et al. Increased total iron and zinc intake and lower heme iron intake reduce the risk of esophageal cancer: A dose-response meta-analysis. *Nutr Res*. 2018 59:16-28 <https://www.ncbi.nlm.nih.gov/pubmed/30442229>
- 16- Murdolo G, et al. Selenium and Cancer Stem Cells. *Adv Cancer Res*. 2017;136:235-257 <https://www.ncbi.nlm.nih.gov/pubmed/29054420>
- 17- Bishop NC, et al. Nutritional aspects of immunosuppression in athletes. *Sports Med*. 1999;28(3):151-76. Review.
- 18- Ahmadi A, Enayatizadeh N, Akbarzadeh M, Asadi S, Tabatabaee SH. Iron status in female athletes participating in team ball-sports. *Pak J Biol Sci*. 2010 Jan 15;13(2):93-6. <https://www.ncbi.nlm.nih.gov/pubmed/20415144>

- 19- Brutsaert TD, et al. Iron supplementation improves progressive fatigue resistance during dynamic knee extensor exercise in iron-depleted, nonanemic women. *Am J Clin Nutr.* 2003 Feb;77(2):441-8 <https://www.ncbi.nlm.nih.gov/pubmed/12540406>
- 20- DellaValle DM, Haas JD. Iron supplementation improves energetic efficiency in iron-depleted female rowers. *Med Sci Sports Exerc.* 2014;46(6):1204-15. <https://www.ncbi.nlm.nih.gov/pubmed/24195864>
- 21- Arikan S, Akkus H, Halifeoglu I, Baltaci AK. Comparison of plasma leptin and zinc levels in elite athletes and sedentary people. *Cell Biochem Funct.* 2008;26(6):655-8. <https://www.ncbi.nlm.nih.gov/pubmed/18570187>
- 22- Bird SP, Mabon T, Pryde M, Feebrey S, Cannon J. Triphasic multinutrient supplementation during acute resistance exercise improves session volume load and reduces muscle damage in strength-trained athletes. *Nutr Res.* 2013;33(5):376-87. <https://www.ncbi.nlm.nih.gov/pubmed/23684439>
- 23- Jablan J, et al. Level of minerals and trace elements in the urine of the participants of mountain ultra-marathon race. *J Trace Elem Med Biol.* 2017;41:54-59. <https://www.ncbi.nlm.nih.gov/pubmed/28347463>
- 24- Ji X, Grandner MA, Liu J. The relationship between micronutrient status and sleep patterns: a systematic review. *Public Health Nutr.* 2017;20(4):687-701.
- 25- Nerbass FB, et al. Calcium channel blockers are independently associated with short sleep duration in hypertensive patients with obstructive sleep apnea. *J Hypertens.* 2011 Jun;29(6):1236-41. <https://www.ncbi.nlm.nih.gov/pubmed/21546880>
- 26- Chollet D, et al. Blood and brain magnesium in inbred mice and their correlation with sleep quality. *Am J Physiol Regul Integr Comp Physiol.* 2000;279(6):R2173-8 <https://www.ncbi.nlm.nih.gov/pubmed/11080083>
- 27- Nielsen FH, Johnson LK, Zeng H. Magnesium supplementation improves indicators of low magnesium status and inflammatory stress in adults older than 51 years with poor quality sleep. *Magnes Res.* 2010;23(4):158-68. <https://www.ncbi.nlm.nih.gov/pubmed/21199787>
- 28- Rondanelli M, et al. The effect of melatonin, magnesium, and zinc on primary insomnia in long-term care facility residents in Italy: a double-blind, placebo-controlled clinical trial. *J Am Geriatr Soc.* 2011;59(1):82-90
- 29- Roffe C, Sills S, Crome P, Jones P. Randomised, cross-over, placebo controlled trial of magnesium citrate in the treatment of chronic persistent leg cramps. *Med Sci Monit.* 2002;8(5):CR326-30. <https://www.ncbi.nlm.nih.gov/pubmed/12011773>
- 30- Akbaraly TN, et al. Plasma selenium over time and cognitive decline in the elderly. *Epidemiology.* 2007;18(1):52-8. <https://www.ncbi.nlm.nih.gov/pubmed/17130689>
- 31- González HF, Visentin S. Micronutrients and neurodevelopment: An update. *Arch Argent Pediatr.* 2016;114(6):570-575. <https://www.ncbi.nlm.nih.gov/pubmed/27869417>
- 32- Ghosh S, Sinha JK, Raghunath M. Epigenomic maintenance through dietary intervention can facilitate DNA repair process to slow down the progress of premature aging. *IUBMB Life.* 2016;68(9):717-21 <https://www.ncbi.nlm.nih.gov/pubmed/27364681>
- 33- Akuffo KO, et al. The Impact of Supplemental Antioxidants on Visual Function in Nonadvanced Age-Related Macular Degeneration: A Head-to-Head Randomized Clinical Trial. *Invest Ophthalmol Vis Sci.* 2017;58(12):5347-5360. <https://www.ncbi.nlm.nih.gov/pubmed/29053808>
- 34- Brown NA, Bron AJ, Harding JJ, Dewar HM. Nutrition supplements and the eye. *Eye (Lond).* 1998;12 (Pt 1):127-33. <https://www.ncbi.nlm.nih.gov/pubmed/9614529>
- 35- Solovyev ND. Importance of selenium and selenoprotein for brain function: From antioxidant protection to neuronal signalling. *J Inorg Biochem.* 2015;153:1-12. <https://www.ncbi.nlm.nih.gov/pubmed/26398431>
- 36- Adebayo OL, Adenuga GA, Sandhir R. Selenium and zinc protect brain mitochondrial antioxidants and electron transport chain enzymes following postnatal protein malnutrition. *Life Sci.* 2016;152:145-55. <https://www.ncbi.nlm.nih.gov/pubmed/26965089>

- 37- Chen J, Tellez G, Escobar J, Vazquez-Anon M. Impact of Trace Minerals on Wound Healing of Footpad Dermatitis in Broilers. *Sci Rep.* 2017;7(1):1894. <https://www.ncbi.nlm.nih.gov/pubmed/28507338>
- 38- Thompson JM, et al. The Role of Micronutrients in Alopecia Areata: A Review. *Am J Clin Dermatol.* 2017;18(5):663-679. <https://www.ncbi.nlm.nih.gov/pubmed/28508256>
- 39- Alghadir AH, Gabr SA, Al-Eisa ES, Alghadir MH. Correlation between bone mineral density and serum trace elements in response to supervised aerobic training in older adults. *Clin Interv Aging.* 2016;11:265-73. <https://www.ncbi.nlm.nih.gov/pubmed/27013870>
- 40- Zofková I, Nemcikova P, Matucha P. Trace elements and bone health. *Clin Chem Lab Med.* 2013;51(8):1555-61. <https://www.ncbi.nlm.nih.gov/pubmed/23509220>
- 41- Matias CN, et al. Magnesium intake mediates the association between bone mineral density and lean soft tissue in elite swimmers. *Magnes Res.* 2012;25(3):120-5. <https://www.ncbi.nlm.nih.gov/pubmed/23015157>
- 42- Crowley EK, et al. Dietary Supplementation with a Magnesium-Rich Marine Mineral Blend Enhances the Diversity of Gastrointestinal Microbiota. *Mar Drugs.* 2018;16(6) pii: E216. <https://www.ncbi.nlm.nih.gov/pubmed/29925774>
- 43- Winkler J, Ghosh S. Therapeutic Potential of Fulvic Acid in Chronic Inflammatory Diseases and Diabetes. *J Diabetes Res.* 2018;2018:5391014. <https://www.ncbi.nlm.nih.gov/pubmed/30276216>
- 44- Gandy JJ, Snyman JR, van Rensburg CE. Randomized, parallel-group, double-blind, controlled study to evaluate the efficacy and safety of carbohydrate-derived fulvic acid in topical treatment of eczema. *Clin CosmetInvestig Dermatol.* 2011;4:145-8. <https://www.ncbi.nlm.nih.gov/pubmed/21931500>
- 45- Meena H, Pandey HK, Arya MC, Ahmed Z. Shilajit: A panacea for high-altitude problems. *Int J Ayurveda Res.* 2010;1(1):37-40. <https://www.ncbi.nlm.nih.gov/pubmed/20532096>
- 46- Blake DR, et al. Preliminary assessment of the efficacy, tolerability and safety of a cannabis-based medicine (Sativex) in the treatment of pain caused by rheumatoid arthritis. *Rheumatology (Oxford).* 2006;45(1):50-2. <https://www.ncbi.nlm.nih.gov/pubmed/16282192>
- 47- Blake A, et al. A selective review of medical cannabis in cancer pain management. *Ann Palliat Med.* 2017;6(Suppl 2):S215-S222. <https://www.ncbi.nlm.nih.gov/pubmed/28866904>
- 48- Booz GW. Cannabidiol as an emergent therapeutic strategy for lessening the impact of inflammation on oxidative stress. *Free Radic Biol Med.* 2011;51(5):1054-61. <https://www.ncbi.nlm.nih.gov/pubmed/21238581>