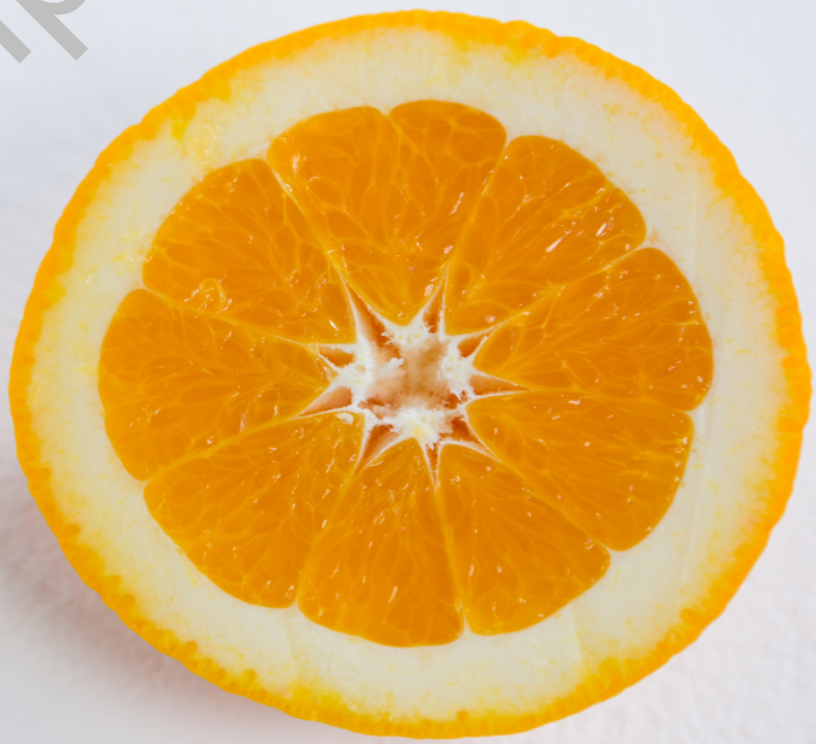
Bumrungrad International HOSPITAL

MICRONUTRIENTS

Resource: MISS EXAMPLE REPORT
HN: XXXXXXXXX
Date: XX XXX XXXX
Clinic: XXXXXXXXXX



About Micronutrients Profile

The Micronutrients Profile measures levels of two types of nutrients needed for optimal health: Trace Minerals and Vitamins/ Antioxidants. These are nutrients not found naturally in the body that must be obtained from the diet or through nutritional supplementation. Micronutrients are important for optimal health because they are needed to activate enzymes. All chemical reactions in the body occur with the assistance of enzymes, which are a type of protein made by the liver. When enzymes are first produced, they enter the bloodstream in an inactive form. In order to become activated they need both a vitamin and a mineral cofactor to attach to them. You can think of minerals and vitamins as being like the two keys used to unlock a safety deposit box in a bank. Both are needed or the enzyme will remain inactive and unable to function.

About this Report

The Micronutrients Profile measures 1) Trace Minerals and 2) Vitamins/ Antioxidants. The Trace Minerals Profile includes macro minerals which are found in larger amounts in the body such as calcium, the chief bone mineral, and magnesium, the most common enzyme mineral cofactor as well as microminerals such as selenium and chromium.

The Micronutrients Profile also includes measurements of several vitamins and antioxidants. By definition, vitamins are chemical compounds needed for proper enzyme function that the body is unable to make on its own. They must be obtained either through diet or supplementation.

Vitamins and Anti-Oxidants

Vitamins and Antioxidants

OPTIMAL

All chemical reactions in the body occur with the assistance of enzymes, which are a type of protein made by the liver. When enzymes are first produced, they enter the bloodstream in an inactive form. In order to become activated they need both a vitamin and a mineral cofactor to attach to them. You can think of minerals and vitamins as being like the two keys used to unlock a safety deposit box in a bank. Both are needed or the enzyme will remain inactive and unable to function.

Optimal level of Vitamins/Antioxidants means that your current diet and/or nutrient supplementation is providing adequate levels of all Vitamins/Antioxidants levels included in the Micronutrients Profile.

Summary of Effects

- **Your Coenzyme Q10 (CoQ10) value of 0.4 umol/L was Low**

  CoQ10 is a vitamin-like substance also known as ubiquinone. Because it can be synthesized by the liver from the amino acid tyrosine, CoQ10 is not strictly a vitamin. Although CoQ10 is not essential, it is crucial for the production of energy in our cells. There are some rare hereditary conditions associated with low coQ10 levels. Follow-up with a specialist may be suggested by your treating physician.

- **Your Alpha Tocopherol value of 31.43 umol/L was Suboptimal**

  Alpha-tocopherol is a component of the E group of fat-soluble vitamins. Vitamin E is an essential fat-soluble vitamin with potent antioxidant and free radical scavenging properties.

- **Your Gamma Tocopherol value of 1.3 umol/L was Suboptimal**

  General manifestations of deficiency can include weakness, immune dysfunction, and neurological problems including walking difficulties, numbness, tremors, and problems with balance.

- **Your Alpha Carotene value of 0.18 umol/L was Suboptimal**

  α-Carotene is a member of the Vitamin A family. As a Vitamin A precursor, it is also indirectly important in normal growth and development, immune system function, vision, reproduction, and cellular communication.

- **Your Vitamin A value of 1.12 umol/L was Suboptimal**

  Vitamin A is significantly involved in vision and eyesight as it is a critical component of the light-absorbing protein, rhodopsin, found in the retina. It also supports the conjunctival membranes and cornea.

  Vitamin A is crucial for multiple tissues and functions in the body. Among them are the nervous system, skin and mucosa, bones, reproductive organs, and immune system. Vitamin A has essential roles in immune and reproductive function. It helps regulate cell growth and differentiation and supports heart, kidney, and lung function. It is important in prenatal and postnatal development, reproduction, cellular communication, regulation of gene expression, and formation of red blood cells.

- **Your Vitamin C value of 70.54 umol/L was Suboptimal**

  Vitamin C, also known as ascorbic acid, is the main water-soluble antioxidant vitamin in the body.

- **Your 25 (OH) Vitamin D3 value of 41.7 ng/mL was Suboptimal**

  Vitamin D is in the fat-soluble vitamin family (Vitamins A, D, E, and K). In many ways, it is much more than just a vitamin, which in general refers to something used as a cofactor to facilitate enzyme function. Vitamin D also has hormonal effects and plays many metabolic roles as many cells in the body have vitamin D receptors. Vitamin D was formerly thought to be mainly involved in bone health, and it does in fact, increase bone density, helps prevents osteoporosis, and decrease fracture risk. But vitamin D also helps with diabetes

and helps prevent and is useful in the treatment of multiple cancers. Vitamin D also lowers blood pressure, helps prevent M.S., reduces heart attack risk (in men), and reduces chronic pain.

- **Your 25 (OH) Vitamin Total D value of 44.1 ng/mL was Suboptimal**
- **Your Lutein + Zeaxanthin value of 0.39 umol/L was Suboptimal**

  Lutein and zeaxanthin are two important carotenoids, which are pigments of colorful fruits and vegetables. They're structurally very similar and work as powerful anti-oxidant for the body, especially for eye protection and skin health.

  Lutein and zeaxanthin protect your body's proteins, fats, and DNA from stressors and can even help recycle glutathione, another key antioxidant in your body. Low levels of lutein and zeaxanthin in the eyes are associated with age-related macular degeneration (AMD) and cataracts. They're actually found in greater amounts in leafy green vegetables, kale, parsley, spinach, broccoli, and peas. Orange juice, honeydew melon, kiwis, red peppers, squash, and grapes are also good sources of lutein and zeaxanthin.

- **Your Beta Cryptoxanthin value of 0.33 umol/L was Suboptimal**

  Beta-cryptoxanthin is classified as a pro-vitamin A carotenoid. It is a strong antioxidant and prevents free radical damage from your cells and DNA. It may reduce the risk of cancers, and rheumatoid arthritis. Beta-Cryptoxanthin may have benefits for reducing the risk of non-alcoholic fatty liver disease (NAFLD). It is actually found in oranges, papaya, peaches, tangerines, tropical fruit, yellow or orange fruits, and vegetables.

- **Your Lycopene value of 0.99 umol/L was Optimal**

  Lycopene has been found helpful against cancers of the pancreas, colon, rectum, esophagus, oral cavity, breast, cervix, prostate, and breast. Lycopene can potentially help prevent and reduce the risk of coronary heart disease. It has also been found to play a contributing role in the treatment of age-related macular degeneration, male infertility, diabetes, and osteoporosis.

- **Your Beta Carotene value of 2.7 umol/L was Optimal**

  Your current dose of beta-carotene through diet and supplements is optimal.

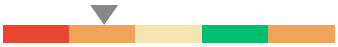
- **Your Vitamin B12 value of 735.7 pg/mL was Optimal**

  Vitamin B12 is a water-soluble vitamin that is important for energy production, helping build red blood cells to carry oxygen and protect the nervous system. It is essential for RNA, DNA synthesis, and metabolism. We must have Vitamin B12 to maintain optimum weight and vital energy levels. Vitamin B12 is primarily obtained from animal-based products. The human body cannot produce vitamin B12, but it can store significant amounts in the liver.

- **Your Folic Acid value of 16.9 ng/mL was Optimal**

  The term folate refers to the form of this nutrient found naturally in foods, while folic acid is the synthetic form used in supplements. Often, however, the terms are used interchangeably. Folic acid has been shown to reduce neural tubes in newborns and may possibly be helpful in the prevention of certain cancers, cardiovascular diseases, and dementia. Folic acid must be acquired from supplementation or diet

Detailed Results

Test	Result	Optimal Range	Units	Indicator	Scale
Coenzyme Q10 (CoQ10)	**0.4**	1.0 - 2.7	umol/L	Low	
Alpha Tocopherol	**31.43**	44.0 - 71.36	umol/L	Suboptimal	
Gamma Tocopherol	**1.3**	3.0 - 8.23	umol/L	Suboptimal	
Lycopene	0.99	0.7 - 1.37	umol/L	Optimal	
Beta Carotene	2.7	1.5 - 3.78	umol/L	Optimal	
Alpha Carotene	**0.18**	0.25 - 0.58	umol/L	Suboptimal	
Vitamin A	**1.82**	2.0 - 3.1	umol/L	Suboptimal	
Vitamin B12	735.7	617.0 - 883.0	pg/mL	Optimal	
Vitamin C	**70.54**	90.0 - 130.0	umol/L	Suboptimal	
25 (OH) Vitamin D3	**[illegible]**	50 - 90	ng/mL	Suboptimal	
25 (OH) Vitamin Total	**44.1**	50 - 90	ng/mL	Suboptimal	
Folic Acid	16.9	14.7 - 19.9	ng/mL	Optimal	
Lutein + Zeaxanthin	**0.39**	0.471 - 0.718	umol/L	Suboptimal	
Beta Cryptoxanthin	**0.33**	0.598 - 1.079	umol/L	Suboptimal	

Trace Minerals

Trace Minerals

SUBOPTIMAL

Explanation of Trace Minerals Profile

Trace Minerals Profile includes macro minerals which are found in larger amounts in the body such as calcium, the chief bone mineral, and magnesium, the most common enzyme mineral cofactor as well as microminerals such as selenium and chromium. Your Trace Mineral Score can be either low, suboptimal, or optimal.

Low level of trace minerals means that your current diet and/or nutrient supplementation is providing suboptimal levels of one or more minerals needed for optimal health.

Summary of Effects

- **Your Chromium value of 0.33 ug/L was Low**

  Chromium is an essential micronutrient required by the body in trace amounts. Low levels of chromium are typical of patients with diabetes or obesity. Increased chromium supplementation has been found helpful in these conditions.

- **Your Copper value of 1119.48 ug/L was High**

  Copper is found in grains, legumes, fish (especially lobster, oyster, and prawn), cheese, nuts, duck, chocolate, organ meats, nuts, mushrooms, and gelatin.

- **Your Zinc value of 79.51 ug/dL was Low**

  Zinc is the second most abundant mineral found in the body after iron. It is essential for the immune system, growth, and development, in neurological function and reproduction. Presently, mild zinc deficiencies are postulated to lead to endocrine disorders, neurologic dysfunction, cancer, aging, and degenerative diseases.

- **Your Ferritin value of 137.7 ng/mL was Suboptimal**

  Very low levels suggest a need for iron supplementation, while less severe levels can be corrected by increasing the consumption of iron-rich foods such as liver and red meat. Please follow up with your internist or gastroenterologist to check for possible occult blood loss.

- **Your Magnesium (Mg) value of 2.3 mg/dL was Optimal**

  Magnesium is among the most abundant minerals in the body. It is involved as the mineral cofactor in more than 300 enzymes, which are the molecules needed to perform essential biochemical reactions in the body. Magnesium is essential in energy production processes such as glycolysis (breakdown of glucose or sugar) where it directly acts as the enzyme activator of the Mg-ATP complex. It is also involved in oxidative phosphorylation in the mitochondria and in the synthesis of nucleic acids and proteins.

- **Your Selenium value of 140.98 ug/L was Optimal**

  Selenium is an essential micronutrient, required in the human body in very small quantities. Selenium is essential to protect against oxidative damage, especially when combined with vitamin E. As an antioxidant, it protects DNA and cell membranes from toxic free radicals that may contribute to aging and chronic diseases like cardiovascular diseases and cancer.

- **Your Calcium value of 9.3 mg/dL was Optimal**

  Calcium is an essential mineral nutrient primarily known for its key role in skeletal mineralization and bone health. It is among the top five minerals in the human body with 99 percent of its total concentration in the bones and teeth.

Detailed Results

Test	Result	Optimal Range	Units	Indicator	Scale
Chromium	**0.33**	1.0 - 1.5	ug/L	Low	
Copper	**1119.48**	900 - 1000	ug/L	High	
Ferritin	**137.7**	150.0 - 250.0	ng/mL	Suboptimal	
Magnesium (Mg)	2.3	2.28 - 2.6	mg/dL	Optimal	
Selenium	140.98	120.0 - 150.0	ug/L	Optimal	
Zinc	**79.51**	103.3 - 120.0	ug/dL	Low	
Calcium	9.3	9.0 - 9.6	mg/dL	Optimal