VibrantWellness
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Final Report Date:	06-24-2020 11:20	**Specimen Collected:**	06-23-2020 10:06
Accession ID:	2006240002	**Specimen Received:**	06-24-2020 04:06

LAST NAME	FIRST NAME	GENDER	DATE OF BIRTH	ACCESSION ID	DATE OF SERVICE
PATIENT	TEST2	MALE	1998-01-11	2006240002	06-23-2020 10:06

PATIENT

Name: TEST2 PATIENT
Date of Birth: 1998-01-11
Gender: Male
Age: 22

Fasting: FASTING

PROVIDER

Practice Name: Vibrant IT4 Practice
Provider Name: Demo Client, DDD (999994)
Street Address: TEST STREET
City: TEST CITY
State: KY
Zip #: 42437
Telephone #:
Fax #: 000-000-0000

LAST NAME	FIRST NAME	GENDER	DATE OF BIRTH	ACCESSION ID	DATE OF SERVICE
PATIENT	TEST2	MALE	1998-01-11	2006240002	06-23-2020 10:06

Whole Blood Nutrient Profile Test Results:

Vitamins

Test Name	Current	Previous (06/24/2020)	Ref. Range
Vitamin A (mcg/dL)	62.4	43.6	40.0~90.0
Vitamin B1 (nmol/L)	77.6	57.3 ↓	70.0~180.0
Vitamin B2 (mcg/L)	201.7	229.8	137.0~290.0
Vitamin B3 (ng/mL)	52.6	12.6	5.0~80.0
Vitamin B6 (ng/mL)	4.3	1.8 ↓	4.0~83.0
Vitamin B5 (mcg/L)	333.3	103.2	20.0~360.0
Vitamin C (mg/dL)	0.4 ↓	0.3 ↓	0.5~4.0
Vitamin D3 (mcg/mL)	3.5	0.9 ↓	1.1~5.2
Vitamin E (mg/L)	12.9	8.2	5.0~30.0
Vitamin K1 (ng/mL)	3.73	3.97	0.10~5.00
Vitamin K2 (ng/mL)	0.85 ↓	0.49 ↓	1.00~8.00
Folate (ng/mL)	526.2	598.7	≥498.0

Minerals

Test Name	Current	Previous (06/24/2020)	Ref. Range
Calcium (mg/dL)	24.2	24.4	15.0~30.0
Manganese (ng/mL)	9.8	11.4	8.0~19.0
Zinc (mcg/mL)	6.1	6.0	4.4~8.6
Copper (mcg/mL)	0.9	1.0	0.5~1.5
Chromium (ng/mL)	1.07	1.13	0.10~1.20
Iron (mg/dL)	110.5	112.8	88.0~117.0
Magnesium (mg/dL)	3.6	4.4	3.6~7.7
Copper to Zinc Ratio	2.5	1.3	0.9~2.6

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Metabolites

Test Name	Current	Previous (06/24/2020)	Ref. Range
Choline (nmol/mL)	32.7	33.8	10.0~35.0
Inositol (nmol/mL)	84.3	49.9	40.0~85.0
Carnitine (nmol/mL)	52.2	60.5	20.0~75.0
MMA (nmol/mL)	14.6	10.3	6.0~14.9

Amino Acids

Test Name	Current	Previous (06/24/2020)	Ref. Range
Asparagine (nmol/mL)	118.8	126.9	90.0~160.0
Glutamine (nmol/mL)	643.0	630.9	450.0~817.0
Serine (nmol/mL)	197.9	130.2 ↓	184.0~280.0
Arginine (nmol/mL)	172.7	223.6	85.0~250.0
Citrulline (nmol/mL)	83.3	74.5	40.0~85.0
Isoleucine (nmol/mL)	108.0	91.8	53.0~124.0
Valine (nmol/mL)	209.8	238.9	195.0~370.0
Leucine (nmol/mL)	170.2	175.1	121.0~249.0

Antioxidants

Test Name	Current	Previous (06/24/2020)	Ref. Range
Coenzyme Q10 (mcg/mL)	0.52 ↓	0.15 ↓	1.10~4.89
Cysteine (nmol/mL)	36.0	22.0	10.0~37.0
Glutathione (mcg/mL)	211.7	260.4	176.0~323.0
Selenium (ng/mL)	143.5	195.9	120.0~200.0

VITAMINS

Physiological Function

Vitamin C has a major function of being an antioxidant. It boosts immunity through increasing white blood cells, in addition to supporting regeneration of vitamin E. Vitamin C can also reduce atherosclerosis, stroke and high blood pressure, and inflammation.

Because of its role in the generation of connective tissue, it is necessary for optimal collagen production. Vitamin C is also an important component of l-carnitine, which is necessary for breakdown of fats into energy.

How it gets depleted

Vitamin C is most commonly depleted in the absence of sufficient dietary intake.

Vitamin C levels can be depleted during times of severe oxidative stress.

Clinical Manifestations of Depletion

- Low levels of vitamin C have been associated with reduced bone density.
- Signs of deficiency include: bleeding gums, easy bruising, anemia, fatigue, weakness and joint pain. These symptoms are the result of weakened or deficient connective tissues throughout the body.
- Severe cases of vitamin C deficiency are called scurvy.

Food Sources

Food sources of vitamin C include: oysters, tropical fruits such as guava, papaya, pineapple, oranges, kiwi, and cantaloupe; leafy greens such as kale and spinach; cruciferous vegetables such as broccoli, brussel sprouts, cauliflower, and cabbage; berries, such as strawberries, raspberries, blueberries, blackberries, bell peppers, and amaranth.

Supplement Options

- The RDA for vitamin C is 75 mg/day for women and 90 mg/day for men. 120 mg/day is recommended during pregnancy and lactation.
- The half-life of vitamin C in circulation after supplementation is about 30 minutes, therefore, large singular doses of vitamin C may not be as therapeutic as smaller, more frequent doses of vitamin C.
- In addition to taking supplemental vitamin C, α-Lipoic acid helps restore vitamin C levels when depleted.

Physiological Function

Vitamin K is a group of fat-soluble vitamins. This group of vitamins includes two natural vitamins: vitamin K1 and vitamin K2.

Vitamin K2 is the main storage form of Vitamin K in animals. It has several forms, referred to as menaquinones.

The nomenclature denoting vitamin K2 types will include an'MK'to specify this is a menaquinone and the number following this denotes how many isoprenyl units are on the side chain of the molecule. The most common forms are MK-4 and MK-7.

Bacteria in the colon can convert K1 (from plant-based foods) into vitamin K2.

Vitamin K2 is necessary to prevent arterial calcification, which it does by activating matrix GLA protein (MGP). This matrix GLA protein is present in blood vessels and inhibits soft tissue calcification. Matrix GLA protein needs to be carboxylated to work properly and Vitamin K2-MK7 plays a major role in this carboxylation.

How it gets depleted

Dietary deficiency of vitamin K1 is extremely rare unless there has been significant damage to the intestinal lining, such as in inflammatory bowel disorders (Crohn's, ulcerative colitis, etc), liver disease, cystic fibrosis, and fat malabsorption disorders.

In addition, the use of oral blood-thinning medications and some antibiotics can interfere with vitamin K.

Individuals with chronic kidney disease are at risk for vitamin K deficiency. Individuals with ApoE4 genotype may be at greater risk for low vitamin K.

Since Vitamin K is a fat soluble vitamin, following a chronically low-fat diet can inhibit absorption.

Clinical Manifestations of Depletion

Inadequate levels of both Vitamin K1 and K2 will radically increase risk for heart disease and stroke.

Chronically low vitamin K levels can lead to uncontrolled bleeding and chronic marginally low vitamin K levels are correlated in some studies with osteoporosis.

Because vitamin K2 also assists in calcium homeostasis, low or deficient levels of vitamin K2 can lead to unregulated calcium release from bone tissue sources in the presence of vitamin D3 supplementation. Supplementation of vitamin D2 does not tend to lead to this, however. It is recommended that vitamin K2 be supplemented when vitamin D3 is supplemented.

Levels of K2 are inversely related to cardiovascular disease and coronary calcification.

Food Sources

The best sources of vitamin K2 include some fermented foods predominantly natto and some rare fermented cheeses, and liver. There are minor amounts present in egg yolk and butter.

Supplement Options

Studies suggest daily therapeutic doses of about 360-500 micrograms (mcg) of vitamin K2

Fermented foods contain a wide variety of different bacteria, and only certain ones—such as Bacillus subtilis—actually make vitamin K2. Dietary vitamin K2 intake is enhanced with regular consumption of fermented foods. You can make fermented foods yourself, by using a starter culture specifically designed to optimize K2.

Vitamin K2 supplements come in 'MK' varieties and MK-4 is what all forms of vitamin K2 are converted in vivo. If one takes an MK-7 variety, the body will convert to MK-4, however, MK-4 supplements can be found commercially to bypass activation after absorption

ANTIOXIDANTS

Physiological Function

CoQ10 is a fat-soluble compound primarily synthesized by the body and also consumed in the diet. It is found in virtually all cell membranes and participates in the mitochondria to convert carbohydrates and fatty acids into ATP. CoQ10 also supports cell signaling, gene expression, stimulation of cell growth, inhibition of apoptosis, control of thiol groups, formation of hydrogen peroxide, and control of membrane channels.

How it gets depleted

CoQ10 is most commonly depleted through use of cholesterol-lowering medication, such as statins. Other causes of CoQ10 deficiency include genetic mutations that limit biosynthesis, unknown reasons in the aging process, cancer, and smoking.

Clinical Manifestations of Depletion

Signs of CoQ10 deficiency include muscle weakness and fatigue, high blood pressure, and slowed thinking; more extreme symptoms of CoQ10 deficiency include chest pain, heart failure, and seizures.

Food Sources

Food sources of CoQ10 are considered poor sources of the nutrient. Foods that contain more CoQ10 than others include organ meats from red meat sources. Nuts are considered a moderate source but would have to be eaten in extreme amounts to get the daily requirement.

Supplement Options

- There is currently no established RDA, AI, or UL for CoQ10.
- CoQ10 comes in both ubiquinone and ubiquinol forms; ubiquinol is considered the active form, however, the body uses both forms as needed.
- Typical doses required to restore minimum CoQ10 levels while using statin drugs are 100-200 mg/day.
- Intestinal absorption of CoQ10 is limited, but optimized if consumed with a meal containing fat.
- There are really no adverse symptoms with high dose CoQ10 supplementation; however, supplementation is typically not recommended for pregnant or lactating women due to lack of controlled studies.