LIST OF MINERAL FUNCTIONS AND DEFICIENCY SYMPTOMS FOLLOWED BY THE VITAMIN & NUTRIENT DEFICIENCY SYMPTOMS

As outlined by Dr. Joel Wallach in his booklet "A DIRE WARNING"

- **Antimony**
  - Effective against blood flukes

- **Bismuth**
  - Ulcers result from lack of bismuth & a bacteria Heliobacter pylori

- **Boron**
  - Aids efficient calcium and magnesium use
  - Essential for bone metabolism
  - Proper endocrine function
  - Reduces calcium loss from bones (Osteoporosis)

- **Calcium**
  - High protein diets increases demands for calcium
  - **Deficiency:**
    - Arthritis
    - Back pains (sciatica, disc problems)
    - Bell's Palsy
    - Bone spurs
    - Brittle fingernails
    - Calcium deposits
    - Cognitive impairment
    - Delusions
    - Depression
    - Eczema
    - High Blood Pressure
    - Hyperactivity
    - Hypertension
    - Insomnia
    - Irritability
    - Kidney stones
    - Limb numbness
    - Muscle cramps/spasms/twitches
    - Nervousness
- Neuromuscular excitability
- Osteomalacia (failure to mineralize the protein bone matrix)
- Osteoporosis (& Dowager's Hump, spontaneous fractures, kyphosis)
- Panic attacks
- Periodontal disease - receding gums (osteoarthritis of facial bones & jaw bones)
- PMS
- Pica (eating lead paint)
- Rickets
- Retarded growth
- Tetany
- Tooth decay

- **Cesium**
  - Cancer aid; cesium enters cancer cell and produces alkaline condition

- **Chromium**
  - *Deficiency:*
  - ADD/ADHD
  - Anxiety
  - Aortic cholesterol plaque
  - Coronary blood vessel disease
  - Depression/Manic depression
  - Diabetes (Vanadium also)
  - Dr. Jekyll/Mr. Hyde rages
  - Elevated blood cholesterol
  - Elevated blood triglycerides
  - Fatigue
  - Hyperactivity
  - Hypercholesterolemia
  - Hypoglycemia - low blood sugar (vanadium & copper also)
  - Infertility and decreased sperm count
  - Learning disabilities
  - Negative nitrogen balance (body lean mass/protein loss)
  - Prediabetes (vanadium also)
  - Peripheral neuropathy
  - Retarded growth
  - Shortened life span

- **Cobalt**
  - *Deficiency:*
  - Anemia
  - Anorexia
  - Emaciation, listless, starved look, pale mucus membranes
  - Essential part of Vitamin B 12 (Growth and nerve system function)

- **Copper**
  - *Deficiency:*
  - Alopecia (hair loss)
  - Anemia (common in vegans & high milk users)
  - Aneurysms (on wall bulges)
  - Aneurysm / cerebral hemorrhage
  - Arthritis (especially where growth plates are involved)
  - Cerebral palsy & hypoplasia (failure to form) of the cerebellum
- Criminal or violent behavior, blind rage, explosive outbursts
- Depression
- Dermatosis
- Diarrhea
- Dry brittle hair
- Fatigue
- Fragile bones
- Hernias
- High blood cholesterol
- Hypercholesterolemia
- Hypo or Hyper thyroid
- Ptosis (sagging tissue - eye lids, skin, breasts, stomach, etc.)
- Kawasaki Disease
- Learning disabilities
- Liver cirrhosis (number 9 killer in the U.S.)
- Ruptured vertebral discs problems
- Reduced glucose tolerance (low blood sugar)
- Respiratory disease
- Swachman's Syndrome
- Varicose veins
- White or Gray hair

- **Europium**
  - Doubles the life span of laboratory animals

- **Fluoride**
  - In plant based colloidal form will aid bone strength & no toxicity

- **Germanium**
  - Aid in oxygen utilization
  - Enhances immune system function (killer cells, interferon, macro phages and T-suppressor cells)
  - Highly efficient electrical impulse initiator
  - *Deficiency:*
    - Arthritis
    - Cancer
    - Low energy
    - Osteoporosis

- **Gold**
  - Reduces active joint inflammation

- **Iodine**
  - Copper needed to utilize iodine
  - Needed by body for thyroid function (Thyroxin is thyroid hormone)
  - *Deficiency:*
    - Cold intolerance
    - Brittle nails
    - Bulging eyes
    - Constipation
    - Depression
    - Dry skin & hair
    - Elevated blood cholesterol
    - Excessive sweating
- Fatigue
- Frequent bowel movements
- Goiter (throat swelling)
- Hair loss
- Hand tremors
- Heat intolerance
- Heavy periods or less than 28 day cycles
- Hypothyroidism
- Increased appetite < LI> Irritability
- Inability to concentrate
- Insomnia
- Light periods or longer than 28 day cycles
- Low basal body temperature
- Low sex drive
- Muscle aches and pains
- Muscle cramps
- Muscle weakness
- Nervousness
- Over-active Thyroid
- Poor memory Puffy face
- Rapid pulse
- Under-active Thyroid
- Weight gains Weight loss

- Copper
  - Deficiency:
  - Anemia
  - Angular Stomatitis
  - Anorexia
  - Brittle nails
  - Confusion
  - Constipation
  - Depression
  - Dirt eating (pica)
  - Dizziness
  - Dysphagia
  - Fatigue
  - Fragile Bones
  - GI upset
  - Growth Retardation
  - Headaches
  - Ice eating (pica)
  - Heart palpations
  - Hemoglobin (Oxygen carrier in red blood cells)
  - Irritability
  - Listlessness and fatigue Memory deficits Sore Tongue

- Lanthium
  - Deficiency may be involved in chronic fatigue diseases

- Lithium
  - Deficiency:
- ADD
- Depression
- Infertility
- Lithium deficiency aggravated by high sugar consumption
- Manic depression
- Rages & fits
- Reduced growth rate
- Reproductive failure
- Shortened life span

**Magnesium**
- *Deficiency:*
- Anxiety
- Asthma
- Anorexia
- Birth Defects
- Calcification of small arteries
- Confusion
- Depression
- Growth failures
- Hyperactivity/synophobia
- Hypotension
- Hypothermia
- Insomnia
- Irritability
- Malignant calcification of soft tissue
- Menstrual
- Migraines
- Muscle pains/tremors/weakness
- Nervousness/Nueromuscular irritability
- Neuromuscular problems
- Restlessness
- Seizures
- SIDS
- Tachycardia/palpitations
- Tetany - Convulsions
- Tremors
- Vertigo

**Manganese**
- *Deficiency:*
- Asthma
- Ataxia
- Atherosclerosis
- Chondrornalacia
- Chondrodystrophy
- Convulsions
- Dizziness
- Hearing Loss
- Hypercholesterolemia
- Hypoglycemia
- Infertility (failure to ovulate or testicle atrophy)
- Loss of sex drive
- Pancreatic atrophy
- Poor cartilage formation problems
- Repetitive Motion Syndromes (like TMJ, Carpal Tunnel Syndrome)
- Retarded growth rates
- Shortened long bones
- Still births or spontaneous miscarriages
- Tinnitus

**Molybdenium**
- Essential as a metalloenzyme of several enzyme systems

**Nickel**
- *Deficiency:*
  - Anemia (low hematocrit)
  - Delayed puberty
  - Depressed oxidative ability of the liver
  - Dermatitis
  - High newborn mortality
  - Poor growth
  - Poor zinc absorption
  - Rough/dry hair coat in animals

**Phosphorus**
- *Deficiency:*
  - Anorexia
  - Anxiety
  - Apprehension
  - Bone pain
  - Dyspnea
  - Fatigue
  - Irritability
  - Numbness
  - Paresthesias
  - Pica
  - Tremulousness
  - Weakness
  - Weight loss

**Potassium**
- *Deficiency:*
  - Acne
  - Arrhythmia
  - Cognitive impairment
  - Constipation
  - Depression
  - ECG changes
  - Edema
  - Fatigue
  - Glucose intolerance
  - Growth retardation
  - Hypercholesterolemia
- Hyperretlexia
- Hypotension
- Insomnia
- Mental apathy
- Muscular weakness
- Nervousness
- Palpitations
- Plydipsia
- Proteinuria
- Respiratory distress
- "Salt" retention
- Tachycardia (rapid heart rate)
- Xerosis

- Praseodymium
  - Doubles life span in laboratory animals
  - Enhances normal cell growth

- Samarium
  - Doubles life span in laboratory animals
  - Enhances normal cell growth
  - Animal studies show deficiencies cause:
    - Cancer prevention properties
    - Hearing loss
    - Male pattern baldness
    - Poor growth & Poor feeding

- Selenium
  - Effective anti-oxidant
  - Deficiency:
    - Age spots or liver spots
    - ALS (Lou Gehrig's Disease)
    - Alzheimer's Disease (associated high vegetable oil consumption)
    - Anemia (red blood cell fragility)
    - Cardiomyopathy
    - Cataracts
    - Cancer Risk
    - Cystic fibrosis
    - Cancer (associated with high vegetable oil intake) (Number 2 killer)
    - Fatigue
    - Growth Retardation
    - Heart palpitations (irregular heart beat)
    - High infant mortality
    - HIV (AIDS)
    - Impaired immunity
    - Infertility
    - Keshan Disease (myocardial fibrosis)
    - Liver cirrhosis
    - Low birth weight
    - Multiple Sclerosis
    - Muscular dystrophy
    - Myalgia
- Pancreatitis
- Pancreatic atrophy & fibrosis
- Parkinson's Disease (associated lead poisoning)
- Scoliosis
- Sterility in males
- Sudden Infant Death Syndrome (SIDS)
- Sickle cell anemia

- Silica
  - Increases collagen in growing bone by 100%
  - Deficiency:
    - Brittle fingernails
    - Dry brittle hair
    - Poor calcium utilization arterial wall strength problems
    - Poor skin quality

- Silica
  - Anti-bacterial
  - Anti-fungal
  - Anti-viral
  - Kills over 650 diseases causing organisms
  - Systemic disinfectant & immune support
  - Subdues inflammation & promotes healing

- Strontium
  - Essential trace element
  - Strontium can replace calcium in many organisms including man

- Sulfur
  - Important mineral used in several amino acids within the body
  - Involved in functions of hemoglobin, insulin hormone, adrenal hormones, enzymes, and antibodies
  - Deficiency:
    - Degeneration of cartilage, ligaments and tendons
    - Lupus
    - Several collagen diseases
    - Sickle cell anemia

- Thulium
  - Doubles the life span of laboratory animals
  - Enhances growth of normal cells

- Vanadium
  - Aids in glucose (blood sugar) oxidation and transport
  - Anti-Cancer properties
  - Decreases cholesterol production
  - Enhances insulin effectiveness (aids with blood sugar problems)
  - Increases effectiveness of heart muscle contraction
  - Deficiency:
    - Cardiovascular disease
    - Diabetes
    - Elevated cholesterol & triglycerides
    - Hypoglycemia
    - Increased infant mortality
    - Infertility
- Obesity
- Slow growth

**Yttrium**
- Doubles life span of laboratory animals
- Enhances normal cell growth

**Zinc**
- *Zinc deficiency associated congenital birth defects:*
  - Cleft lip & Cleft palate
  - Clubbed limbs
  - Down's syndrome
  - Heart & lung defects
  - Hiatal hernia & umbilical hernia
  - Small or absent eyes
  - Spina bifida
  - Webbed toes or fingers
  - Urogenital defects
  - *Deficiency:*
    - Acne
    - Acrodermatitis enteropathica
    - Alopecia (hair loss)
    - Anemia
    - Anorexia and/or Bulimia
    - Apathy
    - Birth defects (see above)
    - Bad body odors ("smelly tennis shoe" syndrome)
    - Brittle nails
    - Depression
    - Diarrhea
    - Enlarged prostate
    - Eczema
    - Fatigue
    - "Frizzy" hair
    - High infant mortality
    - Hypercholesterolemia
    - Hypogewusia (loss of sense of taste)
    - Infertility
    - Impaired wound healing
    - Impotence
    - Irritability
    - Lethargy
    - Loss of sense of smell
    - Malabsorption
    - Memory loss
    - Paranoia
    - Pica (eating hair, wool, etc.)
    - Poor growth (short stature)
    - Sexual immaturity (remain in pre-puberty state)
    - Small and/or poor ovary and testes function
    - Sterility
- Weaken immune function
- White spots on nails