LESSON 7 – ASSIGNMENT

1. List 2 sources for each of 10 different minerals considered essential to human health.
   - Calcium: fish and almonds.
   - Magnesium: cheese and watercress.
   - Phosphorus: Dairy products and whole meal products.
   - Sodium: salt and eggs.
   - Chlorine: cheeses and smoked meats.
   - Potassium: Bananas and apricots.
   - Iron: meat and fish.
   - Zinc: egg yolks and nuts.
   - Iodine: Iodine salt and yeast.
   - Selenium: corn and Brazilian nuts.

2. Provide a 1-2 sentence description of the role of 10 different minerals in the body.
   - Magnesium: strengthen immune system, block harmful activity of poisoning metals, participate in insulin formation process, indispensable for vitamin C normal metabolism, the potassium rate is dependant on magnesium density.
   - Molybdenum: support fats and carbohydrates metabolism, protect against cancer, indispensable for iron metabolism, and prevent anemia because it is necessary for iron assimilation, needed for urine acid formation.
   - Cobalt: together with vitamin B12 create blood red cells and ensure nervous system health.
   - Copper: necessary for hormone formation in adrenal gland, support iron assimilation, maintain in good condition blood vessels and connecting tissue, necessary for energy creation and essential for vitamin C assimilation.
   - Vanadium: impede cholesterol embedding in blood vessels, prevent heart diseases and attacks, helps to reduce, high blood pressure and decrease sugar level in blood.
   - Manganese: needed for proper brain functioning, needed for antioxidation processes, participate in energy creation process, ake part in calcium metabolism, needed for melanin transformation and fat acid synthesis.
   - Fluorine: prevent caries, protect against osteoporosis and cure it, prevent heart diseases and protect against calcification of organs and muscle-bones structures.
   - Boron: helps to preserve proper minerals and hormones level needed for healthy bones maintenance, helps to reduce calcium loss at women in menopause, helps to prevent osteoporosis and build musculature.
   - Lipic acid: Antioxidant, Intensify glycogen levels in the liver what increase liver protective values. Used in diabetes complication treatment of Diabetic neuropathy.
   - Chrome: strengthen insulin activity, reduce cholesterol level, prevent vessels inflammation, support slimming, reduce hunger and delay aging.

3. List the foods you have eaten on any one day in the past week. Look at the minerals you would get from these foods. In one to two paragraphs, discuss any minerals which may be supplied in inappropriate quantities and include any health issues you may develop if you maintained this diet long term. (Just list the problems, don’t describe or explain them).
   - **Breakfast:**
     - 1 cup with water and juice of a lemon or lime (Calcium, Potassium, Copper and Vitamins A, B and C)
     - 1 cup of warm cocoa (magnesium, calcium, iron, zinc, copper, potassium and manganese) with soya Milk (iron, potassium, zinc and selenium).
     - 2 slices of Pumpernickel Rye Bread (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium and Selenium).
     - Almond Butter (Calcium4Magnesium, Phosphorus, Potassium).
     - 2 slices of Feta Cheese (Calcium, Phosphorus, Potassium, Sodium).
   - **Morning Tea:**
     - 6 Brazil Nuts (Selenium), 2 Dried figs (Iron), 4 soaked almonds (Calcium).
   - **Lunch:**
     - Buckwheat grouts cooked (zinc, copper, and manganese);
     - With 1 onion (Phosphorus, Potassium);
     - Smoked Salmon (Phosphorus, Potassium, Sodium and Selenium);
     - Spinach raw (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Iodine, Zinc, Manganese, Selenium);
     - 1 carrot raw (Potassium, Phosphorus and Magnesium).
     - 1 tomato (Potassium).
     - Asparagus (Potassium and Iodine).
     - Beetroot grated (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Zinc, Manganese and Selenium).
     - Dressing: 1 tbsp Olive Oil (sodium, iron, calcium, potassium, phosphorus, manganese, magnesium, boron, zinc, and copper), Apple Cider Vinegar, Himalayan Salt (Magnesium, Phosphorus Potassium, Zinc, Iron Selenium, Manganese, Copper and Sodium), Sesame Seeds (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Zinc, Copper, Manganese, Selenium);
     - 1 banana (Potassium) and 1 orange (Potassium and Calcium).
• Afternoon tea (before my 5 hours teaching!)
  • 1 cup with water and juice of a lemon or lime (Calcium, Potassium, Copper and Vitamins A, B and C)
  • 1 cup of warm cocoa (magnesium, calcium, iron, zinc, copper, potassium and manganese) with soya Milk (iron, potassium, zinc and selenium).
  • 2 slices of Pumpernickel Rye Bread (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium and Selenium)
  • Almond Butter (Calcium, Magnesium, Phosphorus, Potassium)
  • 2 slices of Feta Cheese (Calcium, Phosphorus, Potassium, Sodium)
  • 1 apple (Potassium, Calcium, Phosphorus and Magnesium).
• Dinner:
  • Quinoa (Magnesium, Iron, Potassium and Phosphorus);
  • Tofu (Manganese, Iron, Selenium, Copper, Phosphorus, Calcium and Magnesium);
  • Cabbage (Calcium, Phosphorus and Magnesium)
  • Carrot (Potassium, Phosphorus and Magnesium)
  • Tomato (Potassium)
  • Beetroot (Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Zinc, Manganese and Selenium);
  • Mushroom (Sodium, Potassium, Calcium, Iron, Zinc, Magnesium, Selenium)
  • Strawberries (Potassium).

I think I have a very balanced diet but the main concern is related to the MAGNESIUM that lacks on New Zealand Soil and I was advised because I was having muscle cramps and stiffness to take a Magnesium powder supplement every day.

In case I won’t take the supplement the symptoms of deficiency are:

Neurological:
  • Behavioral disturbances
  • Irritability and anxiety
  • Lethargy
  • Impaired memory and cognitive function
  • Anorexia or loss of appetite
  • Nausea and vomiting
  • Seizures

Muscular:
  • Weakness
  • Muscle spasms (tetany)
  • Tics
  • Muscle cramps
  • Hyperactive reflexes
  • Impaired muscle coordination (ataxia)
  • Tremors
  • Involuntary eye movements and vertigo
  • Difficulty swallowing

Metabolic:
  • Increased intracellular calcium
  • Hyperglycemia
  • Calcium deficiency
  • Potassium deficiency

Cardiovascular:
  • Irregular or rapid heartbeat
  • Coronary spasms

4. Describe symptoms of 5 different nutrient disorders. Keep your answers brief, no more than 3 sentences each.

• Osteoporosis: If we do not get enough calcium, or if our body does not absorb enough calcium from the diet, bone production and bone tissues may suffer. As we age, calcium and phosphate may be reabsorbed back into the body from the bones, which makes the bone tissue weaker. This can result in brittle, fragile bones that are more prone to fractures, even without injury.
• Goiter: is a swelling in the thyroid gland, which can lead to a swelling of the neck or larynx (voice box). Goiter rarely occurs when the thyroid gland is functioning properly. Worldwide, over 90% cases of goiter are caused by iodine deficiency.
• Anemia - iron deficiency is a condition in which the body does not have enough healthy red blood cells. Iron is an important building block for red blood cells. When your body does not have enough iron, it will make fewer red blood cells or red blood cells that are too small. This is called iron deficiency anemia.
• Keshan's disease is a condition which occurs when there is a deficiency of selenium intake. The Symptoms of deficiency are: Arrhythmia, Cardiac insufficiency, Heart enlargement - this can lead to heart failure, Loss of heart tissue. If Keshan's disease is not diagnosed and treated, then it can result in heart failure due to the selenium deficiency.
• Beriberi or Thiamine deficiency; Vitamin B1 deficiency, Wet beriberi affects the cardiovascular system and Dry beriberi and Wernicke-Korsakoff syndrome affect the nervous system. The Symptoms: Difficulty walking, Loss of feeling (sensation) in hands and feet, Loss of muscle function or paralysis of the lower legs, Mental confusion/speech difficulties, Pain, Strange eye movements (nystagmus).
5. Select 5 different mineral supplements and give a 2-3-sentence explanation of how they might be used in a specified human diet.

1. Concentrated Mineral Drops from Great Salt Lake Utah: Contains Magnesium, Chloride, Sulphate, Sodium, Potassium, Sulphate, Lithium and Boron and varying trace amounts: Bromide, Carbonate, Calcium, Silicon, Nitrogen, Selenium, Phosphorus, Iodine, Chromium, Manganese, Titanium, Rubidium, Cobalt, Copper, Antimony, Molybdenum, Strontium, Zinc, Nickel, Tungsten, Germanium, Scandium, Vanadium, Tellurium, Tin, Lanthanum, Yttrium, Silver, Gallium, Bismuth, Zirconium, Cerium, Cesium, Gold, Beryllium, Hafnium, Samarium, Terbium, Europium, Gadolinium, Dysprosium, Thorium, Holmium, Lutetium, Erbium, Ytterbium, Neodymium, Praseodymium, Niobium, Tantalum, Thallium, Rhenium, Indium, and Palladium plus other minerals found in sea water. There are no artificial ingredients.

2. Multigenics Intensive Care: Provides 400 IU of vitamin D for those with reduced intake, less efficient intestinal absorption, or reduced biosynthesis of this important vitamin. Provides L-glutamine to support the integrity of the intestinal lining, which is important for optimal absorption of nutrients. Delivers comprehensive bone support by featuring the mineral complex and organic factors contained in microcrystalline hydroxyapatite concentrate (MCHC), and a 2:1 ratio of calcium to magnesium. Features L-5-methyl tetrahydrofolate—a body-ready, nature-identical folate. Provides natural source vitamin E in a 1:1 ratio of alpha to gamma tocopherols (along with beta and delta tocopherols) to more closely resemble the tocopherol profile found naturally in vitamin E-rich plants.

3. Meta B Complex; is a broad-spectrum vitamin, mineral and amino acid dietary supplement, help to relieve stress and increase energy. It is formulated to assist brain functions and helps maintain healthy digestive function. This formula may also assist in the maintenance of healthy skin and hair. Meta B Complex is a high potency, B vitamin formula with supportive cofactors such as vitamin C, potassium and magnesium that may assist in the management of vitamin and mineral deficiency, thereby aiding the improvement of general wellbeing.

4. B-Stress Free, Adrenal stress support from Good Health is a special formulation of herbal extracts, vitamins and minerals specifically selected for their ability to support the body's response to stress. Panax ginseng has traditionally been used for its restorative effect in cases of physical or mental exhaustion and during times of stress. Contains B Vitamins, ginseng, licorice, passionflower and valerian. Slow release B.

5. Ultimate Multivitamin Capsule: Includes all the essential vitamins and minerals also contains additional essential nutrients, such as bioflavonoids, rutin, chlorophyll, betaine HCL and glutamic acid. We have also added trace elements of vanadium, boron and molybdenum.

6. From the list of vitamins below, select 6 and provide 3 sources for each, noting the relative value of each source:

   • **Vitamin D**: Vitamin D prevents osteoporosis, depression, prostate cancer, breast cancer, and even effects diabetes and obesity.
     1. Sunlight on skin: Vitamin D is perhaps the single most underrated nutrient in the world of nutrition. That's probably because it's free: your body makes it when sunlight touches your skin.
     2. Pure Cod liver oil
     3. Egg 1 whole (vitamin D is found in egg yolk)

   • **Vitamin E**:
     1. Sunflower Seeds
     2. Spinach leaves
     3. Kiwifruit

   • **Vitamin K**
     1. Kale
     2. Spinach
     3. Collard Greens

   • **Ascorbic acid**
     1. Orange
     2. Guava
     3. Red Bell Pepper

   • **Thiamine**
     1. Tuna
     2. Banana
     3. Salmon

   • **Riboflavin**
     1. Asparagus
     2. Bananas
     3. Okra
7. Discuss the increasing use of vitamin supplements. Why do you think more people are using supplements? Are people currently using supplements now using more supplements? Do you think the increase in vitamin supplement use is a good thing or bad?

The numbers of people taking vitamins supplements are growing. Just talking with a group of friends I notice everyone takes at least one dietary supplement. It is interesting to note that supplemental calcium use and vitamin D use is very common in New Zealand and also in Brazil. Supplements can contain high amounts of specific nutrients, and are often used to increase nutrition in a person’s diet. I talked with some doctors and dietitians about use of vitamins, nearly all of them agreed that a healthy diet is a better alternative to nutrients in pill form, my diabetes doctor told me: “People are looking for help with what they believe is a problem but trying to solve it the wrong way, some people have a diet that contains too many processed foods that do not have the nutrients we need to keep us healthy – soft drinks and chips -- so people respond by taking vitamins-that’s not your case!” The pill is a nice idea, but we have no reason to think this one-size-fits-all dose makes any sense for each individual; the same idea fits for the types of diet and quantities of food. And if individuals are taking supplements, they should be sure to tell their doctors what those are and why they’re taking them. There probably is a perception among the population that taking a dietary supplement is an easy way to obtain necessary nutrients and improve health, but this isn't necessarily true, for most dietary supplements there is not a lot of evidence they improve health, including multivitamins, there is also some data that, in general, the people who take dietary supplements are least likely to need them… they already have a good diet. We can find studies about the effects of vitamin D on a variety of health conditions, including cholesterol, heart disease, influenza, breast cancer and osteoporosis, just to name a few. The vitamin is important to the body as it aids in the absorption of calcium, which in turn helps to form and maintain healthy bones. Some studies found that supplemental calcium increased from 28 percent to 61 percent among women aged 60 and older in the past two decades, lots of women around the world are taking calcium to prevent osteoporosis but not paying attention to their vitamin D status, without adequate vitamin D, you do not absorb your calcium supplement, natural sources of vitamin D include fatty fish, eggs, mushrooms exposed to sunlight, cod liver oil and ultraviolet rays from the sun. Many doctors recommend 10 to 15 minutes of sun exposure per day to prevent vitamin D deficiency. Dietary supplements play a role in a healthy lifestyle but they are supplements to, not substitutes for, a healthy diet. They should be used in combination with other healthy habits, like trying to eat a balanced diet, exercising regularly and seeing your doctor.

8. A person is showing symptoms including anemia, dental cavities, frequent colds (low disease resistance) and tremors. They also appear to have a small goiter. What minerals would you suggest this person increase in their diet? (Provide a list only)

- Anemia: Phosphorus, Iron, Cobalt, Copper,
- Dental cavities: Magnesium, Fluorine
- Frequent colds and tremors: Iron, Selenium,
- Goiter: Iodine

9. Complete and submit the table provided in the folder called “Table Lesson 7 Assignment”.

<table>
<thead>
<tr>
<th>VITAMIN</th>
<th>COMMON NAME</th>
<th>FUNCTIONS</th>
<th>SYMPTOMS OF DEFICIENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>THIAMIN</td>
<td>Vitamin B1</td>
<td>Helps the body’s cells convert carbohydrates into energy. It is also essential for the functioning of the heart, muscles, and nervous system.</td>
<td>Weakness, fatigue, psychosis, and nerve damage.</td>
</tr>
<tr>
<td>FOLACIN</td>
<td>B9 or Folic Acid</td>
<td>Required for DNA synthesis and cell growth and is important for red blood cell formation, energy production as well as the forming of amino acids. Folic acid is essential for creating heme, the iron containing substance in hemoglobin, crucial for oxygen transport.</td>
<td>Fatigue, acne, a sore tongue, cracking at the corners of your mouth (same as deficiency of vitamin B2, vitamin B6 as well as iron). Long-term deficiency may result in anemia and later in osteoporosis, as well as cancer of the bowel and cervix.</td>
</tr>
<tr>
<td>RETINOL</td>
<td>Vitamin A</td>
<td>Bone Growth, Night Vision-Normal Function of Genital System and Fertility, Healthy Tissue Disease Resistance</td>
<td>Abnormal visual adaptation to darkness, dry skin, dry hair, broken fingernails, and decreased resistance to infections are among the first signs of vitamin A deficiency</td>
</tr>
<tr>
<td><strong>TOCOPHEROLS</strong></td>
<td>Vitamin E</td>
<td>Protects red blood cells and helps prevent destruction of vitamin A and C.</td>
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<tr>
<td></td>
<td></td>
<td>Mild anemia, Nonspecific neurological deficits, Disorders related to reproduction and infertility, Fragile red blood cells, Age spots, Cataracts, Certain neurological damage, Decrease in sex drive, Muscle, liver, bone marrow and brain function abnormalities, Gastrointestinal diseases, Dry hair or loss of hair, Muscular weakness, Slow tissue healing, Leg cramps.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ASCORBIC ACID</strong></th>
<th>Vitamin C</th>
<th>Growth and repair of tissues in all parts of your body. It is used to: Form an important protein used to make skin, tendons, ligaments, and blood vessels, Heal wounds and form scar tissue, Repair and maintain cartilage, bones, and teeth, Vitamin C is one of many antioxidants.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Anemia, Bleeding gums, Decreased ability to fight infection, Decreased wound-healing rate, Dry and splitting hair, Easy bruising, Gingivitis (inflammation of the gums), Nosebleeds, Possible weight gain because of slowed metabolism, Rough, dry, scaly skin, Swollen and painful joints, Weakened tooth enamel.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>RIBOFLAVIN</strong></th>
<th>Vitamin B2</th>
<th>Help protect cells from oxygen damage, Support cellular energy production, Maintain your supply of other B vitamins</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sensitivity to light, Tearing, burning and itching in and around the eyes, Soreness around the lips, mouth, and tongue, Cracking of the skin at the corners of the mouth, Peeling of the skin, particularly around the nose.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CALCIFEROL</strong></th>
<th>Vitamin D</th>
<th>Vitamin D helps with increasing the absorption of calcium, assists in bone growth and the integrity of bone and promotes strong teeth. It also helps regulate the amount of phosphorus in the body as well as assisting in a healthy heart and nervous system. In some recent studies it has also shown great promise in assisting psoriasis, the immune system, thyroid function as well as normal blood clotting.</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>A shortage can lead to softening of the bone and muscle twitching and convulsions, and in children it causes rickets - resulting in bent legs. In adults, the shortage causes loss of minerals from the bones, (osteomalacia) where the bones are sore, tender, and weak muscles with the possibility of deafness developing. In older people, osteoporosis may appear when protein is also lost from the bone. Vitamin D in short supply is also linked to having a burning sensation in the mouth and throat, diarrhea, insomnia and visual problems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NICOTINIC ACID</strong></th>
<th>Niacin or B3</th>
<th>Essential for releasing energy from carbohydrates, fats and proteins, Helps DNA synthesis, Necessary for healthy skin, nerves and digestive system.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Loss of appetite, Indigestion, Skin lesions, Mental imbalance, Pellagra (gross deficiency).</td>
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<table>
<thead>
<tr>
<th><strong>PHYLLOQUINONE</strong></th>
<th>Vitamin K</th>
<th>Normal blood clotting and synthesis of proteins found in plasma, bone, and kidneys.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>In adults, a vitamin K deficiency is associated with impaired blood clotting. Individuals suffering from a vitamin K deficiency are also more likely to bruise and</td>
</tr>
</tbody>
</table>
bleed easily. Hemorrhages can result in bleeding gums, nosebleeds or heavy menstruation. Excessive bleeding can also be seen in urine and stool. Low vitamin K levels are also associated with poor bone health and may increase your risk for osteoporosis.

| CYANOCOBALAMIN | Vitamin B12 | Vitamin B12 is needed for building proteins in the body, red blood cells, and normal function of nervous tissue. | Symptoms of vitamin B12 deficiency usually don’t appear for at least two years. The reason for this is that the liver usually stores a large amount of vitamin B12. Most people, apart from vegans, have a three to five year supply in their bodies. Initial symptoms of vitamin B12 deficiency can include: Dizziness, Paleness, Shortness of breath, Fatigue, Anemia, Hearing difficulties. If left untreated Vitamin B12 deficiency can cause progressive damage to the nervous system, especially the nerves outside the brain and spinal cord. When the spinal cord is involved, the first symptoms include difficulty in feeling vibrations in the feet, loss of position sense, and loss of muscle coordination (ataxia). Other symptoms of untreated vitamin B12 deficiency may include: Weight loss, An enlarged spleen and liver (hepatosplenomegaly), Exaggerated reflexes, Mild depression and confusion, Hallucinations, personality and mood changes, Irritability, Damage to the optic nerve.

Inositol
Cyclic urea DERIVATE, A coenzyme, Very stable to heat, light, and acids

B8
Prevent fat deposit in liver and other organs, take part in cell membrane and lipoproteins formation, participate in nervous signals transportation, regulate enzymes activity, belongs to one of the best relaxing specimens, release from tension and fears support the sleep, counterbalance copper and zinc level, participate in cholesterol transformation, participate in sperm creation, reduce the blood pressure caused by stress. Include scaly desquamation, muscle pains, and hair loss.

PYRIDOXINE
Vitamin B6
Vitamin B6 supports more vital bodily functions than any other vitamin. Vitamin B6 is a coenzyme for several enzyme systems. Vitamin B6, used mainly in the body for the

Itchy, peeling skin (dermatitis), cracked and sore lips, inflamed tongue and mouth (skin disorders similar to vitamin B2 and vitamin B3 deficiencies), neuropathy,
processing of amino acids, performs this task along with certain enzymes. It is vital in the metabolism of amino acids in the intestines. It allows the amino acids to be synthesized, broken down and absorbed. The forming of histamine, serotonin, dopamine and adrenaline are dependent on vitamin B6. Vitamin B6 is required for the production of serotonin and helps to maintain healthy immune system functions, to protect the heart from cholesterol deposits, and to prevent kidney stone formation.

| PANTOTHENIC ACID | Vitamin B5 | Help turn carbohydrates and fats into usable energy, Improve your ability to respond to stress by supporting your adrenal glands, Assure adequate production of healthy fats in your cells. | Fatigue, Listlessness, Sensations of weakness, Numbness, tingling, and burning/shooting pain in the feet. | poor coordination, confusion, and insomnia. |