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COIMBATORE-641 035, TAMIL NADU



19FTO302 - FOOD NUTRITION

UNIT I -INTRODUCTION TO NUTRITION SCIENCE

TOPIC 4

Micronutrients, also known as vitamins and minerals, are vital to overall health and well-being. Micronutrients are important for functions such as blood-clotting, brain development, immune system function, energy production, and bone health. They play critical roles in disease prevention.

A few micronutrients are vitamins A, C, and D and the minerals iron, potassium, and calcium. This article discusses micronutrients in food, the need for micronutrients, symptoms of micronutrient deficiency, and how many micronutrients are needed daily.

Types of Micronutrients

"Micronutrient" is a general term for vitamins and minerals. Vitamins and minerals can be classified as fat-soluble vitamins, water-soluble vitamins, macrominerals, and trace minerals.

Fat-soluble vitamins do not dissolve in water and are best absorbed when taken along with a source of fat. Excess nutrients are stored in the liver and fatty tissues in the body. Water-soluble vitamins dissolve in water and are not easily stored in the body, with excess usually being excreted in the urine.

Macrominerals are required by the body in higher amounts compared to trace minerals, though both are needed for important roles and functions throughout the body.

Micronutrients and select food sources of each are as follows.

Fat-Soluble Vitamins

Sources of fat-soluble vitamins include:

Vitamin A: Beef liver, fish, eggs, fortified dairy products, sweet potatoes, carrots, cantaloupe

Vitamin D: Fatty fish, such as trout, tuna, and salmon, fish liver oils, egg yolks, fortified milk, mushrooms, especially those exposed to ultraviolet (UV) light

Vitamin E: Nuts (such as almonds, peanuts, and hazelnuts), seeds, vegetable oils, spinach, broccoli

Vitamin K: Leafy green vegetables (such as collard greens, spinach, kale, and broccoli), vegetable oils, blueberries, and pomegranate juice

Water-Soluble Vitamins

Sources of water-soluble vitamins include:

Vitamin C (ascorbic acid): Citrus fruits, kiwi, bell peppers, broccoli, strawberries, tomatoes

Vitamin B1 (thiamine): Whole grains, fortified cereals, pork, beef, trout, tuna, black beans

Vitamin B2 (riboflavin): Eggs, beef liver, milk, yogurt, cheese, fortified cereals, almonds, clams

Vitamin B3 (niacin): Chicken, turkey, beef, pork, salmon, tuna, peanuts, potatoes, rice

Vitamin B5 (pantothenic acid): Beef, chicken, organ meats, whole grains, shiitake mushrooms, sun flower seeds, avocado

Vitamin B6 (pyridoxine): Chickpeas, beef liver, turkey, tuna, salmon, chicken, fortified cereals, potatoes, banana

Vitamin B7 (biotin): Organ meats, eggs, salmon, pork, beef, sun flower seeds, almonds, sweet potato

Vitamin B9 (folate): Beef liver, spinach, fortified cereals and grains, spinach, asparagus, brussels sprouts, beans, nuts

Vitamin B12 (cobalamin): Beef liver, nutritional yeast, fatty fish (salmon, tuna), clams, beef, dairy products, eggs

Macrominerals

Sources of macrominerals include:

Calcium: Dairy products, fortified orange juice, canned sardines and salmon with bones, tofu, soybeans, spinach, kale

Magnesium: Spinach, pumpkin seeds, chia seeds, almonds, cashews, peanuts, soy milk, black beans, potatoes, brown rice

Phosphorus: Dairy products, salmon, chicken, beef, scallops, lentils, potatoes, kidney beans

Potassium: Dried apricots, lentils, prunes, raisins, potatoes, oranges, bananas, acorn squash

Sodium: Salt, prepared and processed foods such as breads, deli meats, frozen meals, canned foods, chips, salted popcorn

Sulfur: Broccoli cabbage, cauliflower, onion, garlic, dairy products, fish, legumes, nuts, meats, raspberries, wheat germ

Trace Minerals

Sources of trace minerals include:

Copper: Shell fish, seeds, nuts, organ meats, whole grains, chocolate, potatoes, mushrooms

Chromium: Beef, pork, turkey, brewer's yeast, grape and orange juice, grain products

Fluoride: Brewed tea and coffee, shrimp, water with added fluoride

Iodine: Iodized salt, seaweed, eggs, cheese, foods made with iodized salt

Iron: Beef, pork, turkey, fortified cereals and grains, spinach, tofu, lentils, beans, dark chocolate

Manganese: Whole grains, clams, oysters, mussels, nuts, soybeans, legumes, rice, coffee, tea, leafy green vegetables

Molybdenum: Legumes, whole grains, nuts, beef liver, milk, yogurt

Selenium: Brazil nuts, fish, shrimp, organ meats, fortified cereals, beef, turkey, chicken, dairy products

Zinc: Beef, oysters, blue crab, fortified cereals and grains, pumpkin seeds, turkey, cheese, shrimp