Vitamin A

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| fortified milk, cheese, butter, liver, eggs, dark green leafy vegetables, deep orange fruits and vegetables | healthy eyes, skin and bones; hormone synthesis | poor teeth and bone growth; night blindness, diarrhea | joint pain, dry and itchy skin, cracked lips, nausea and vomiting, weight loss |

Vitamin D

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| fortified milk, eggs, liver, synthesis with sunlight | strong bones and teeth | misshapen bones in children, softening of bones in adults and bone fractures | kidney stones, fatigue, calcification of soft tissue |

Vitamin E

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| vegetable oils, green leafy vegetables, whole-grain products, egg yolk | antioxidant, stabilizes cell membranes | anemia, weakness | dizzy, weakness, increase effect of anticlotting medications |

Vitamin K

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| green leafy vegetables, cabbage, cauliflower, liver, made by bacteria in intestines | blood clotting | hemorrhaging (bleeding problems) | possible jaundice (yellowing of skin), interfere with anticlotting medications |

Thiamin

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| pork, organ meats, legumes, nuts, whole grains, enriched cereal | used in energy metabolism; nerves, tissue, and muscles depend on them | edema, heart damage, weakness, confusion, paralysis | rapid pulse, weakness, headache, insomnia |

Riboflavin

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| dairy products, dark green leafy vegetables, whole grains and enriched bread and cereal | used in energy metabolism; healthy skin, supports vision | eyes sensitive to sun, skin rash, cracks at corners of mouth |  |

Niacin

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| meat, milk, eggs, poultry, fish, whole grains, enriched bread and cereal, nuts | used in energy metabolism; healthy skin, nervous system and digestive system | weakness, dizzy, lose appetite, confusion, diarrhea, rash | swollen tongue, rash, low blood pressure, diarrhea, nausea and vomiting |

Vitamin B12

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| meat, poultry, fish, eggs, milk, cheese | helps form new cells, healthy nervous system | anemia, fatigue |  |

Vitamin C

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| citrus fruits, broccoli, tomatoes, melons, dark green leafy vegetables, cabbage, strawberries, potatoes | antioxidant, help with wound healing, strengthen resistance to infection | anemia, infections, sore gums, muscle pain, joint pain | nausea, diarrhea, fatigue |

**Minerals**

Calcium

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| milk products, dark green leafy vegetables, broccoli, shrimp, salmon, clams, fortified orange juice, legumes, tofu | strong bones and teeth, muscle contraction and relaxation, blood clotting, nerve function, blood pressure | stunts growth in children, bone loss in adults | extra calcium usually excreted |

Fluoride

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| fluoridated water and toothpastes, seafood | formation of bones and teeth, prevents decay of teeth | tooth decay | discolored teeth, nausea, vomiting |

Iodine

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| iodized salt, seafood | production of thyroid hormone | enlarged thyroid, weight gain, retardation of infant both mentally and physically | enlarged thyroid |

Iron

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| red meat, organ meat, egg yolk, legumes, enriched cereals and breads, green leafy vegetables, dried fruits | helps produce hemoglobin which carries oxygen from the lungs to body cells | anemia, infections, weakness, fatigue, itchy skin, concave nails, pale nailbeds and eye membranes, can't regulate body temperature | infections |

Phosphorus

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| meat, eggs, poultry, milk products, legumes, nuts | strong bones and teeth, buffer in acid-base balance, helps emulsify and transport fat, oxidation of carbohydrates | Anemia, Muscle weakness | calcium deficiency |

Potassium

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| legumes, meat, vegetables, bananas, milk, fruit | fluid balance, transmission of nerve impulses, helps in the making of protein | muscle weakness, fatigue, confusion | muscle weakness, abnormal heart beat, vomiting |

Potassium

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| legumes, meat, vegetables, bananas, milk, fruit | fluid balance, transmission of nerve impulses, helps in the making of protein | muscle weakness, fatigue, confusion | muscle weakness, abnormal heart beat, vomiting |

Sodium

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| salt, in most foods, large amount in processed food | fluid balance, acid-base balance, transmission of nerve impulses | muscle cramps, weakness, loss of appetite | hypertension (high blood pressure) in some people |

Zinc

|  |  |  |  |
| --- | --- | --- | --- |
| **Food Sources** | **Functions** | **Deficiency** | **Toxicity** |
| meat, poultry, fish, whole grain cereals and breads, legumes, nuts | activates enzymes for important functions, production of insulin, making of sperm | growth retardation, diarrhea, vomiting, delay in puberty, weakness, dry skin, delay in wound healing | anemia, increase LDL cholesterol, muscle pain, fever, nausea, vomiting |