## Recommended and Safe Intake Levels: Vitamins, Minerals and Trace Elements

| Recommendation | Definition & Relevance |
|---|---|
| **RDA (Recommended Dietary Allowance)** | RDAs represent the minimum requirement of intake for vitamins and minerals to prevent clinical symptoms of deficiency. RDAs therefore only cover the minimum requirement of healthy people and underestimate actual nutritional requirements for optimal health and well-being. (Act 54 of 1972) (Foodstuffs, Cosmetics and Disinfectants Act) |
| **UL (Upper Tolerable Intake Level)** | Tolerable Upper Intake Level is defined as the maximum nutrient intake by an individual, which is unlikely to pose risks of adverse health effects. The UL has been set to protect the most sensitive individuals in the healthy general population and applies to chronic daily use of nutritional supplements.<br>When possible, the UL is based on the No-Observed-Adverse-Effect-Level (NOAEL), which is the highest intake or experimental oral dose of a nutrient at which no adverse effects have been observed in the individuals investigated. If there is insufficient data to set a NOAEL, then the Lowest-Observed-Adverse-Effect-Level (LOAEL), namely the lowest intake at which an adverse effect has been identified, has been used as a guideline. |
| **Registration Level** | Under Act 101 of 1965, it is stated that if a daily dosage of a nutritional supplement exceed these levels, the product has to be registered as a medicine, which then falls under legislation for medicines, and not foodstuffs as currently relevant to nutritional supplements. |

| Nutrient | RDA (Adults and Children over 10 years) | UL | Registration Levels |
|---|---|---|---|
| Vitamin A (µg RE) | 1000 | >3000<br>LOAEL = 14000 µg except for women of childbearing age, NOAEL = 3000 µg | >1501 (>5000iu) |
| Vitamin D (µg) | 5 | >50<br>NOAEL = 60 µg | >500 |
| Vitamin E (mg α-TE) | 10 | >1000<br>LOAEL = 500 mg/kg | >30 |
| Vitamin C (mg) | 60 | >2000<br>LOAEL = 3000 mg | >300 |
| Vitamin B1 (thiamine) (mg) | 1.4 | Not established | >25 |
| Vitamin B2 (riboflavin) (mg) | 1.6 | Not established | >25 |
| Vitamin B3 (niacin, nicotinic acid, nicotinamide) (mg) | 18 | >35<br>LOAEL = 50 mg | >25 |
| Vitamin B5 (pantothenic acid) (mg) | 6 | Not established | >25 |
| Vitamin B6 (pyridoxine) (mg) | 2 | >100<br>NOAEL = 200 mg | >25 |
| Vitamin B12 (cyanocobalamin) (µg) | 1 | Not established | >25 |
| Folic Acid (µg) | 200 | >1000<br>LOAEL = 5000 µg | >800 |
| Biotin (µg) | 100 | Not established | >400 |
| Calcium (mg) | 800 | >2500<br>LOAEL = 5000 mg | >1200 |
| Phosphorus (mg) | 800 | >4000<br>NOAEL = 10200 mg | >1200 |
| Iron (mg) | 14 | >45<br>LOAEL = 70 mg | >21 |
| Magnesium (mg) | 300 | Not established<br>LOAEL = 360 mg | >460 |
| Zinc (mg) | 15 | >40<br>LOAEL = 60 mg | >22.5 |
| Selenium | Not established | >400 µg<br>NOAEL = 800 µg | |
| Iodine (µg) | 150 | >1100<br>LOAEL = 1700 µg | >22.5 |
| **Conversion Factors** | **Vitamin A:**<br>Retinol equivalents: 1 retinol equivalent (RE) = 1µg retinol = 3.33 iu (international units) vitamin A = 6 µg Beta Carotene) | **Vitamin D:**<br>1 µg cholecalciferol = 40 iu Vitamin D | **Vitamin E:**<br>1 mg d-α-tocopherol = 1 α-TE (Tocopherol Equivalents) = 1.49 iu (1 iu = 1 mg dl-α-tocopheryl acetate) |