

# VITAMIN D

*Feel the light, touch the sun...*

## *Vitamin D*

- Regulates > 2,000 genes
- Optimal levels: 40-60 ng/ml (100-150 nmol/L)
- Always add magnesium and vitamin K2 as they work synergistically with vitamin D.

## *Results of D deficiency*

- Arterial stiffness, hypertension due to ↑ parathyroid hormone production
- Insulin resistance, metabolic syndrome
- Leaky gut, altered gut microbiome
- Sleep disorders
- Impaired muscle strength and physical performance

## *Symptoms of D deficiency*

- Musculoskeletal pain
- Frequent or intense colds or flus
- Depression, impaired cognition, headaches
- Fatigue, head sweating



## *Benefits of sensible sun exposure*

- ↑ Nitric oxide in the skin leading to dilation of blood vessels and a drop in blood pressure.
- ↓ Risk of death from coronary heart disease.
- ↓ Risk of cancers, such as breast, prostate, or colon, by ↓ angiogenesis and metastatic potential.
- Improved gut microbiome - ↑ beneficial, ↓ pathogenic bacteria.
- ↓ Risk of metabolic syndrome.
- ↑ Release of endorphins, leading to stress relief.
- Improved sleep via ↑ neurotransmitter acetylcholine needed for deep phases of sleep.
- ↓ Risk of infections via production of cathelicidin, naturally occurring antibiotic.