

Vitamins

By Noa Wolff
University of Frankfurt-Main

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Definition of vitamins

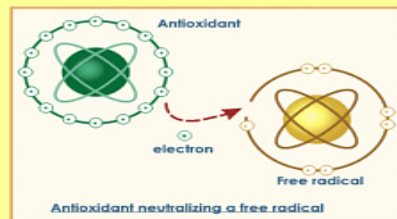
- Vitamins are organic compounds that function as metabolic regulators in the body.
- Vitamins are serving as biological catalysts and/or substrates from chemical reactions.
- They are classified as water soluble or fat soluble.
- The body can not produce Vitamins, therefore it is very necessary to absorb vitamins from food.

water soluble vitamins

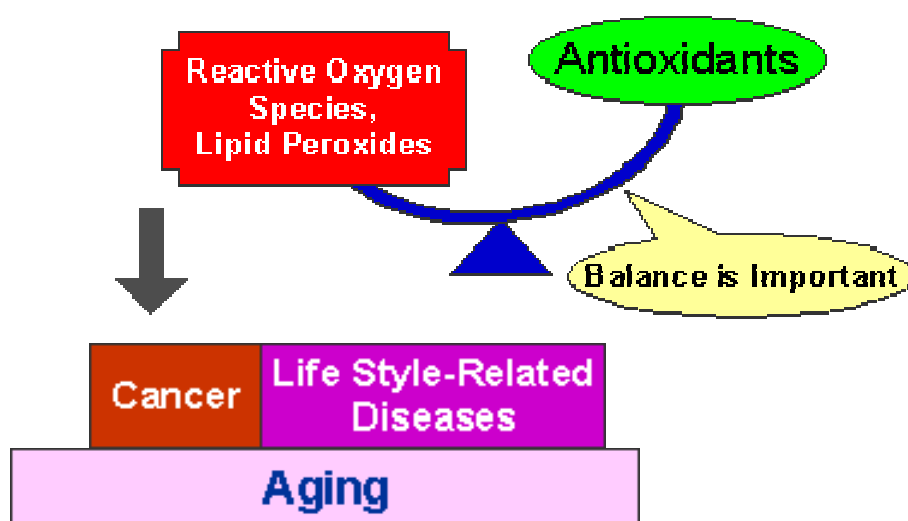
- Vitamins which are absorbed and transported throughout the body by water, blood and other body fluids.
- This Vitamins are only stored in the body for a short period of time.

ANTI OXIDANT

- Vitamin C and E are antioxidants, and protect the body against free radicals.
- They neutralize them by donating one of their own electrons.
- They don't become radicals by themselves because they are stable in both forms.
- In this way they prevent damage and disease.



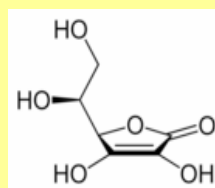
Balance of Oxidative Stress and Anti-Oxidative Defense System



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Ascorbin Acid

- Vitamin C is an organic acid that acts as an antioxidant, it is water soluble
- The daily requirement for a man amounts about 100mg
- molecular formula is $C_6H_8O_6$

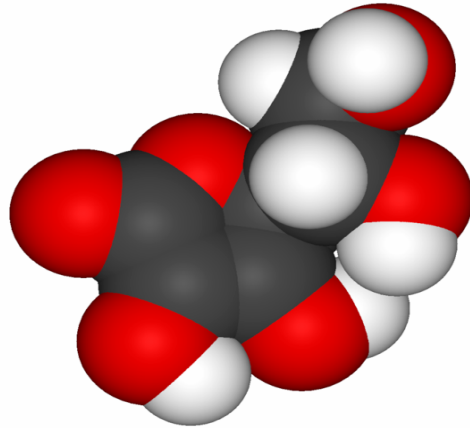


- Returns Vitamin E in his active version.

Uses:

- Photographic developer solutions
- Preservative food additives
- The Relevant Food E numbers in Europe are:
E300 Ascorbin acid, E301 Sodium ascorbat,
E303 Potassium ascorbat

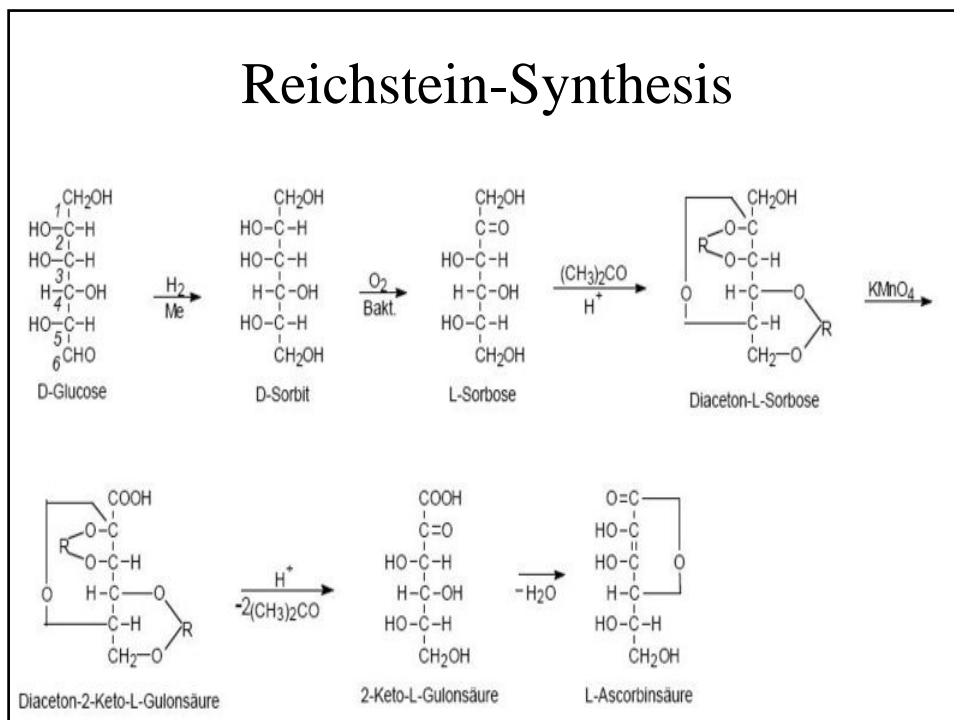
The vitamin C in 3D



Reichstein-Synthesis

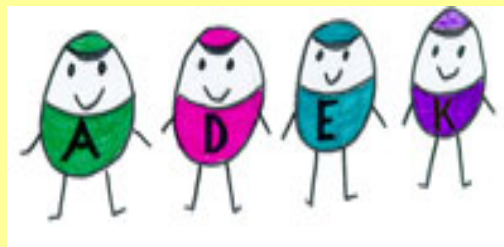
- Today, Vitamin C is produced after the Reichstein- Synthesis.
- The Reichstein- Synthesis is a chemical process engineering to produce Vitamin C from Glucose and sorbit.

- First of all you make an hydration with D- Glucose and Sorbit as a Start reaction, therefore you need Nickel as a catalyst high temperature and pressure.
- Then D- Sorbit reacts to L-Sorbose among pH 4-6 and 30-35°C
- Now we convert the L-Sorbose with Aceton and acid to Diaceton-2- L-gulonacid
- Oxidation with an alcalinity Potassium permanganate solution this gives a Carbon acid: Diaceton-2-keto-L-gulonacid
- At last we build a ring formation and we get the L-Ascorbinacid.



fat- soluble vitamins

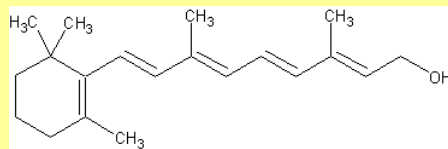
- Are Vitamins who are absorbed together with fat from the intestine, into the blood circulation
- Once in the body, the liver stores them.



Vitamin A

- The most important fat-soluble Vitamins.
- Necessary for the neuron system, the blood corpuscle, the protein metabolism and a lot more.
- The absorption of Vitamin A can be influenced by liver damages and estrogen compounds

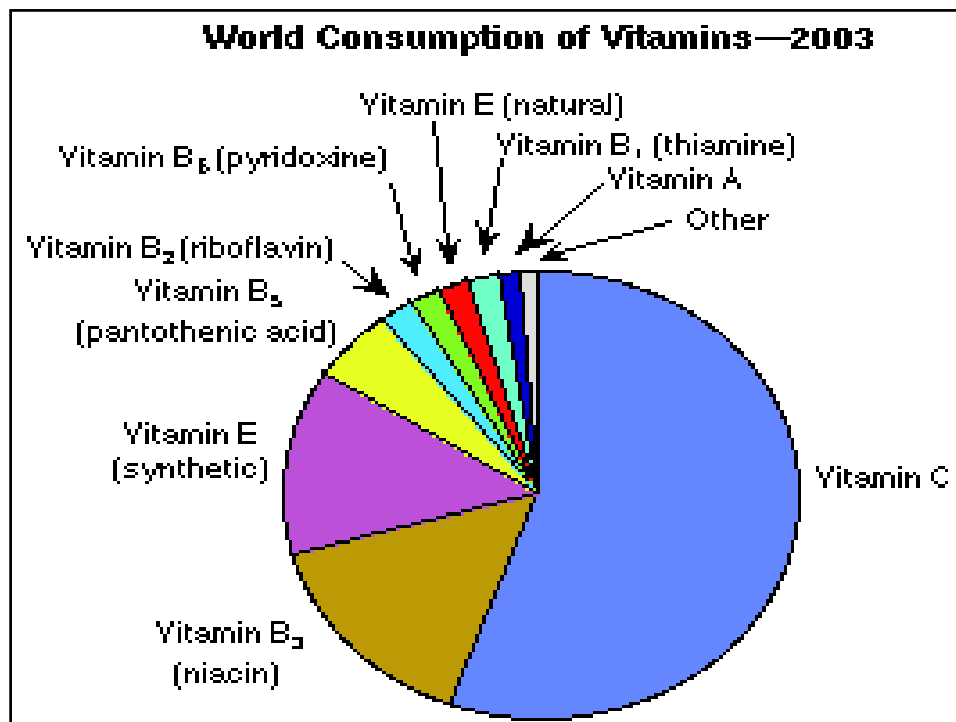
- An overdose of Vitamin A is in the same way unhealthy as an insufficiency
- An overdose has toxic attributes
- Total formula: $C_{20}H_{30}O$
- Synthesis: Wittig-Synthesis



The main Vitamins

The infographic displays six vitamins with their functions and associated food sources:

- Vitamin A**: promote growth, sight and it is important for skin, hair, mucous membrane, tooth and gums. Pregnants must absolutely avoid an overdose of Vitamin A. (Associated with carrots, liver, and eggs)
- Vitamin B 1** Thiamin: Helps nervous system, stimulates transmission between nerves and muscles, repairs nerves damage. It has a prime importance for the metabolism of carbohydrate, herewith responsible for the recovery of energy from food. (Associated with bread, bananas, and oranges)
- Vitamin D** calciferon: Supports the formation of bones and tooth, regulates the household of calcium and phosphat. With the assistance of sunlight, the body can even selfproduce the Vitamine D. (Associated with fish, mushrooms, and sunlight)
- Vitamin B 12** Cyanocobalamin: Effectuate as enzyme component at energy metabolism and at the formation of blood. (Associated with fish, meat, and eggs)
- Vitamin C** Ascorbin acid: Enable the body his own defence power. As a water soluble antioxidant, can make the free radicals (aggressive molecules) harmless. (Associated with lemons, oranges, and green leafy vegetables)
- Vitamin E** (Tocopherol): Take part in the formation of muscles and other tissues. Like betacarotin and ascorbic acid make free radicals harmless and protect the cells from aggressive substances. It is the universal remedie for Arthritis. (Associated with almonds, sunflower seeds, and wheat germ)



Hyper- and Hypovitaminose

- Is in the same way dangerous.
- Both of them induce illness
- Impotence because of syn. B complexes

Natural Vs. Synthetic vitamins

- The Body knows the difference
- Body needs the secondary plant products
- An overdose is simple
- Vitamins are not just molecules, they are complexes.

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