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Vitamin C (*Ascorbic Acid*)

History

Deficiency (Scurvy):
a disease characterized by a spongy and bleeding gums and bleeding under the skin

Known since ancient times:

- **Eber's papyrus**
An ancient Egyptian medical treatise of about 1,500 BC: Described scurvy
- **Hippocrates**
Described soldiers with the disease
- **Crusades (1200 AD) were weakened by scurvy**

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Vitamin C (*Ascorbic Acid*)

History

Deficiency (Scurvy):
a disease characterized by a spongy and bleeding gums and bleeding under the skin

World exploration threatened by scurvy:
(1492 to 1600)

- **Magellan**
Lost 80% of his crew
- **Vasco de Gama**
Lost 100 of his 160 men

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Vitamin C (*Ascorbic Acid*)

History

Discovery

- **1907 (Holst & Frolich):** produced experimental scurvy in guinea pigs
- **1928 (Szent-Gyorgyi):** Isolation of hexuronic acid from orange juice, cabbage juice, and cattle adrenal glands
- **1932 (Waugh & King):** Isolated hexuronic acid from lemons and identified it as vitamin C
- **1933 (Haworth):** Determined the structure of vitamin C

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Vitamin C (*Ascorbic Acid*)

General points

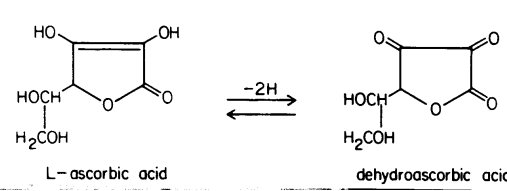
- 1) Not required in the diet of most animals
because (mammals) (birds)
- 2) Ruminants utilize only vitamin C synthesized in their livers because
- 3) Supplementation is not necessary for farm animals
- 4) Dietary requirements only for:

because the enzyme required for the final step of biosynthesis of ascorbic acid is

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Ascorbic Acid (*Vitamin C*)

Structure of vitamin c



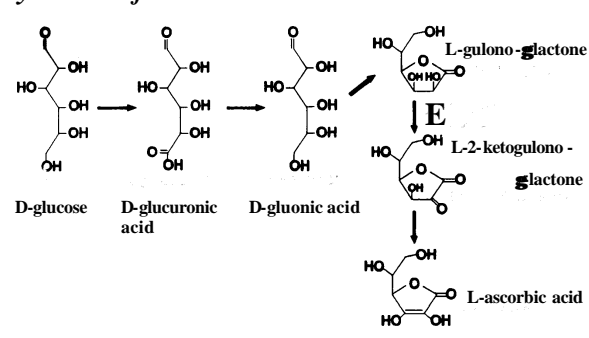
$\xrightleftharpoons{-2H}$

L-ascorbic acid dehydroascorbic acid

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Ascorbic Acid (*Vitamin C*)

Synthesis of vitamin c



D-glucose D-glucuronic acid D-gluconic acid L-gulonolactone L-2-ketogulonolactone L-ascorbic acid

E =

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Ascorbic Acid (*Vitamin C*)

Functions

- 1)
(proline to hydroxyproline)
- 2)
(tyrosine & phenylalanine)
- 3)

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Ascorbic Acid (*Vitamin C*)

Deficiency

- Damage to the
- Damage & loss of
- (teeth, ligaments, etc.)
- An increase in
- (fragile capillaries)
-
- A decrease in

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Ascorbic Acid (*Vitamin C*)

Sources

- Fresh
-

Note:

More susceptible to oxidation than B-vitamins
