Riboflavin (Vitamin B2)

Riboflavin, also known as vitamin B2, is a water soluble vitamin that is the central component of cofactors FAD and FMN. FAD (flavin adenine dinucleotide) is a cofactor involved in several redox reactions and can be reduced to FADH2 when it accepts two hydrogen atoms. This reaction is especially important in the citric acid cycle as FAD is a prosthetic group in the enzyme complex succinate dehydrogenase. FAD is reduced to FADH2 as succinate is oxidized to fumarate and the high-energy electrons are sent through the electron transport chain to produce 1.5 ATP. It is important to note that FADH2 can only produce 1.5 ATP as compared to NADH, which can make 2.5 ATP through the electron transport chain. In humans, signs and symptoms of a riboflavin deficiency include cracked lips, inflammation of the lining of the mouth, and cracks at the corners of the mouth. The eyes may also become bloodshot, itchy, watery and sensitive to bright light.



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Classification

Vitamin B2
Viking (B) Bee in (2) Tutu
Riboflavin is also known as vitamin B2.

Biochemistry

FAD
FAD-clock
FAD (flavin adenine dinucleotide) is a cofactor involved in several redox reactions and can be reduced to FADH2 when it accepts two hydrogen atoms. This reaction is especially important in the citric acid cycle as FAD is a prosthetic group in the enzyme complex succinate dehydrogenase.

FAD Makes 1.5 ATP
FAD-clock Powered by (1) Wand and (5) Hand ATP-batteries
In the citric acid cycle, FAD is reduced to FADH2 as succinate is oxidized to fumarate and the high-energy electrons are sent through the electron transport chain to produce 1.5 ATP on average. It is important to note that FADH2 can only produce 1.5 ATP as compared to NADH, which can make 2.5 ATP through the electron transport chain.

Succinate to Fumarate
Sucker-snake turning into Fumes
In the citric acid cycle, FAD is reduced to FADH2 as succinate is oxidized to fumarate.

DEFICIENCY

Glossitis
Glass-tongue
Patients who are deficient in riboflavin (vitamin B2) may display glossitis, which is an enlarged, red, swollen tongue.

Cheilosis
Key-lips
Cheilosis includes symptoms of fissuring of the lips, inflammation of the lining of the mouth, and cracks at the corners of the mouth, and is characteristic of riboflavin deficiency.

Corneal Vascularization
Corn-eyes
Corneal vascularization is the excessive growth of blood vessels into the cornea and can cause the eyes to become bloodshot, watery, and sensitive to bright light. Corneal vascularization can be caused by riboflavin deficiency.

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