

# Nutrition for Nurses

## Nutrition and Human Welfare

By

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### Thiamine or Vitamin B<sub>1</sub>

Thiamine is an important member and the first of the vitamins discovered in the B group. It is synonymous with "antiberin factor", "antineuritic factor" and the "water soluble B<sub>1</sub>".

This vitamin is essential for maintenance of good appetite, normal digestion and gastro-intestinal tonus. It is necessary for growth, fertility and lactation. It is needed for the normal functioning of nerve tissues, decarboxylation and other metabolic processes.

When the diet lacks thiamine, numerous deficiency states are produced. Nations whose dietaries are nutritionally poor, and consist largely of refined carbohydrates, find that beriberi results in the areas. Beriberi is a complex syndrome consisting of numbness, tingling in the toes, soreness or cramps in the calf muscles, a feeling of coldness in the feet, toe drop, foot drop, disturbance of co-ordination, wasting of the lower limbs, palpitation, enlarged heart, and myocardial lesions.

"Wet beriberi" is generalized edema, along with cardiac dysfunction. There is a partial or complete paralysis of the limbs due to degeneration of the nerves, often accompanied by dropsy, leading to heart failure. Beriberi is common in some parts of India, China, Java and several other countries in South East Asia.

About 40 years ago, a Dutch doctor called Eijkman, had to look after several people in Java, suffering from beriberi. At that time no one knew what caused the disease. Some prisoners in jail were also suffering from beriberi. One day, Eijkman noticed that the hens in the

jail compound were also weak in legs, just like the prisoners with beriberi. He also observed that those hens were eating the same kind of food as the prisoners, *i.e.*, mostly polished white rice. A thought flashed across Eijkman's mind, "Perhaps the prisoners and the hens got sick, because they were given the wrong sort of food."

The rice given in the jail had been milled highly to a polish. The paddy has an outer covering called husk. When the husk is removed we get rice grains. The rice grain has three parts: (1) The little germ from which the new plant comes, (2) the outer layer covering the grain called bran, and (3) the starchy endosperm inside. During the milling process the germ and nearly all the bran are removed. When Eijkman gave the hens unmilled rice, they remained healthy—similarly the hens which received bran in addition to the white rice kept well. Later it was found for the first time that beriberi in human beings could also be cured in the same way. This new concept that the lack of something in the diet would lead to disease was an important step in the discovery of vitamins. The explanation is that the germ and bran of rice and other grains contain most of the vitamins, specially thiamine, and therefore when they are removed beriberi occurs. Along with this discovery, Takakaki, the physician of the Japanese Navy found in 1885, that the personnel afflicted with beriberi recovered when their predominantly polished rice ration was supplemented with barley, vegetables, fish and meat.

When human beings are deprived of vitamin B<sub>1</sub>, the early symptoms of the deficiency seem to be irritability, depres-

sion, defective memory and failure of concentration. Thiamine takes part in an enzyme system responsible for the oxidation of carbohydrates. It is fundamental to cell respiration. Nerve cells are extremely sensitive to shortage of oxygen and are the first to reflect the deficiency of oxygenation.

#### Food sources of Thiamine

Whole cereals, grains and grams,  
Beans, peas and other legums,  
Liver and other organ meats,  
Other meats and pork,  
Milk,  
Groundnuts,  
Parboiled rice,  
Yeast and chocolate.

Parboiling of rice is a common practice in South India, where rice before husking is boiled in water for a short time, dried and then husked. The vitamins in the husk penetrate into the endosperm during the boiling, thus enhancing the vitamin content. Subsequent washing and boiling do not remove the vitamin B<sub>1</sub>.

#### Requirements of Thiamine

One International Unit of vitamin B<sub>1</sub> is the activity of 3.0 micrograms of crystalline thiamine hydrochloride. 0.5 to 1.0 mg. for children and 1-2 mg. for adults are needed for a day.

#### Vitamin B<sub>2</sub>—Riboflavin

Riboflavin is a yellow substance, possessing a green fluorescence in solution. This quality gives the characteristic colour to whey in which it is abundantly present.

This vitamin like thiamine helps the tissues to oxidise carbohydrates, protein and other nutrients. When insufficient riboflavin is provided in the diet, the following symptoms result :

1. Arrest in growth of children.
2. Cracks and sores at the corners of mouth and fissures in lips (These are known as angular stomatitis and cheilitosis).
3. The tongue becomes sore and red "Magenta tongue".

4. The transparent part of the eye becomes misty and the sclerotic looks red. This condition is known as corneal vascularization.
5. Scaliness of the skin occurs, particularly at the angles of the nose.

#### Food Sources

Yeast,  
Liver and other organs,  
Eggs,  
Milk,  
Whole Wheat and dried Pulses, Mangoes,  
Leaf vegetables.

Riboflavin is easily destroyed by light.

#### Requirement

1.5 to 3 milligrams for adults and 0.6 to 2.5 milligrams for children for a day will meet the demands of human beings for this vitamin.



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