

## Lecture 6

### VITAMINS

Vitamins are a group of complex organic compounds which are generally required in the diet in rather small amounts for normal growth and maintenance of health.

In contrast to other nutrients, vitamins are not used for structural or energy requirements or as raw materials for synthesizing other compounds.

In the tropics, the lush vegetation is full of fruits, leafy vegetables, insects and meat animal that provides source of all vitamins.

A varied balanced diet will supply all the necessary vitamins however, in complete absence of a vitamin, clinical conditions known as deficiency diseases develop with fatal consequences.

Animals obtain vitamins through feed they consume, additional supplements of salt lick, microbial synthesis or through maternal transfer.

Vitamins are of two types – FAT SOLUBLE and WATER SOLUBLE, as shown below:

#### (A) FAT SOLUBLE VITAMINS:

	<b>Names</b>	<b>Function(s)</b>	<b>Deficiency Symptom(s)</b>	<b>Source(s)</b>
i.	Vitamin A (Retinol)	Normal vision Epithelium formation	Night blindness Keratinisation Retard growth	Provitamins in green leafy vegetables Milk, fat, liver, carrot
ii.	Vitamin D (Cholecalciferol)	Absorption of minerals Ca, P and phosphatase levels Bone formation Efficiency of feed utilization	Rickets Irregular teeth	Dry forage Fish oils

		Reproduction		
iii.	Vitamin E (Tocopherol)	Normal reproduction and lactation Antioxidant	Low fertility	Egg yolk, germ oils, oils from oilseeds
iv.	Vitamin K (Phylloquinone)	Formation of prothrombin	Failure of blood to clot	Green leafy material, liver Eggs, fish meal

**(B) WATER SOLUBLE VITAMINS**

	Names	Function(s)	Deficiency Symptom(s)	Source(s)
i.	Thiamine (B <sub>1</sub> )	Carbohydrate metabolism	Beriberi Anorexia, paralysis, convulsions, impaired gastric secretions	Yeast, cereals Plant proteins
ii.	Riboflavin (B <sub>2</sub> )	Electron transport system Energy metabolism	Watery eyes “blood shot” Fatty liver Low hatchability of eggs	Yeast, green leaves Milk products
iii.	Niacin	Electron transport chain	“Black tongue” Pellagra Nervous symptoms	Yeast, distillers soluble, rice Wheat bran
iv.	Pyridoxine (B <sub>6</sub> )	Amino acid metabolism	Improper heart function Microcytic anaemia Convulsion	Yeast, cereals Animal tissue

v.	Panthenic acid	Carbohydrate Lipid metabolism	Intestinal disturbances Convulsions	Yeast, liver
vi.	Cobalamine (B <sub>12</sub> )	Amino acid synthesis Protein and nucleic acid synthesis	General weakness	Animal tissue
vii.	Folic acid	Transfer of single carbon units Synthesis of choline & N <sub>2</sub> -bases	Anaemia	Groundnuts Liver, leafy vegetables
viii.	Biotin	Fatty acid synthesis Carbohydrate metabolism	General weakness	Yeast, distillers soluble, liver
ix.	Choline	Formation of acetyl-choline	Fatty livers	Plant protein, wheat Animal tissue
x.	Vitamin C	Formation of tissues Wound healing	Bleeding and swollen gums Scurvy	Fruits and vegetables Liver Green peas