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## Minerals and Vitamins

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### Mineral Supplementation

Cattle require minerals and vitamins in small amounts. They are necessary for practically all metabolic functions. Deficiencies of vitamins and minerals may result in poor performance, deformities in growth and sometimes death.

### Minerals in Cattle Rations

Minerals that are needed in relatively large amounts are called major or macro elements. They are calcium, phosphorus, salt (sodium and chlorine), magnesium, potassium and sulfur.

Minerals needed in small amounts are termed micro or trace minerals. The trace minerals needed by most animals are: iron, zinc, manganese, copper, iodine, cobalt and selenium.

The following factors influence mineral supplementation of cattle rations:

1. Age, sex and stage of production.
2. Mineral composition. Plants vary in mineral profiles because of soils, weather, variety, state of maturity and harvest methods.
3. Differences in availability of minerals in feed.
4. Metabolic function. Some minerals are interrelated and must be in the proper ratio in the ration.

### Vitamins in Cattle Rations

Vitamins are organic chemical compounds that are needed in very small quantities and are essential for good health, growth, maintenance, reproduction and production. They do not build body tissues like minerals, but are essential for specific biochemical reactions so that normal body processes can occur.

Vitamins are classified into two groups: fat soluble vitamins (A, D, E and K) and water soluble vitamins (B-1, B-2, B-12, Niacin, Pantothenic Acid, Choline, Folic Acid, Biotin, Inositol and Vitamin C).

The water-soluble vitamins are present in many natural feedstuffs and manufactured by the rumen bacteria in adequate enough quantity to meet the animals' needs. Vitamins A and E are the only vitamins that need to be supplemented for cattle and sheep under normal conditions.