

- Vitamin E:** The primary function of Vitamin E is to form structural components of membranes and inhibit oxidation of other molecules. There is a close relationship between selenium and vitamin E as both nutrients work in conjunction with the other. Deficiency of Vitamin E causes white-muscle disease in calves and can be prevented and cured by use of vitamin E and selenium supplementation. Vitamin E is important for muscle and vascular function as well as supporting the immune system and disease prevention.

Vitamins and Mineral contents with their nutritional values:

Most of the mineral and vitamin mixture presentations available in the market with different trade names have following contents:

Sr.No.	Ingredients	Nutritional Value per kg
1	Vitamin A	7,00,000 IU
2	Vitamin D ₃	70,000 IU
3	Vitamin E	250 mg
4	Nicotinamide	1000 mg
5	Cobalt	150 mg
6	Copper	1200 mg
7	Iodine	325 mg
8	Iron	1500 mg
9	Magnesium	6000 mg
10	Manganese	1500 mg
11	Potassium	100 mg
12	Sodium	5.9 mg
13	Sulphur	0.72%
14	Zinc	9600 mg
15	DL-Methionine	1000mg
16	Calcium	25.50%
17	Phosphorus	12.75%

Bureau of Indian Standards specification for mineral mixture for cattle :

S. No	Characteristics	Type I (with salt)	Type II (without salt)
1.	Moisture, percent by mass, Max.	5	5
2.	Calcium, percent by mass, Min.	18	23
3.	Phosphorus, percent by mass, Min.	9	12
4.	Magnesium, percent by mass, Min.	5	6.5
5.	Salt (Chloride as Sodium Chloride), percent by mass, Min.	22	-
6.	Iron, percent by mass, Min.	0.4	0.5
7.	Iodine (as KI), percent by mass.	0.02	0.026
8.	Copper, percent by mass, Min.	0.06	0.077
9.	Manganese, percent by mass, Min.	0.10	0.12
10.	Cobalt, percent by mass, Min.	0.009	0.012
11.	Fluorine, percent by mass, Max.	0.05	0.07
12.	Zinc, per cent by mass, Min.	0.30	0.38
13.	Sulphur, percent by mass, Max.	0.40	0.50
14.	Acid insoluble ash, percent by mass	3.00	2.50

Directions for use of mineral mixture:

Before using mineral mixture in dairy farm, always follow advice of qualified veterinary Doctors and instructions given by the manufacturer.

Young calves: 20-25 grams / day / calf

Heifers / non lactating animals: 50 grams / day / animal

Lactating cows and buffaloes: 100-200 grams / day depending upon the level of milk production.

Feeding of mineral and vitamin Mixture: Always feed mineral mixture by mixing it with concentrate feed or by mixing 15-20 grams of common salt to it.

Benefits of feeding of Mineral Mixture:

1. Improves milk production
2. Improves reproduction efficiency of male and female animals.
3. Improves growth and development in calves and heifers hence early puberty.
4. Improves feed intake
5. Improves immunity
6. Improves general health of the animals

Published by:

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Technical Folder no : 23/2020
Financial support under SCSP

Importance of feeding

**MINERAL &
VITAMIN**

Mixture in dairy animals



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Introduction:

Minerals are the inorganic compounds required for normal body maintenance, growth and reproduction of dairy cattle and buffaloes. There are about 40 minerals required by the animal body, however only 14 minerals are of major dietary importance. Minerals that are required in relatively large amounts are called as Macro Minerals i.e. Calcium, Phosphorus, Magnesium, Sulphur etc. Those needed in small amounts are classified as micro minerals i.e. Ferrous, Iodine, Copper, Cobalt, Zinc, Molybdenum, Selenium etc.

Deficiency of minerals in the diet of animals impairs metabolic functions which affects the growth in calves and production and reproduction in adult dairy animals. Hence daily supplementation of mineral mixture in proper doses is must for all the age group animals as minerals are nowhere synthesized in animals body.



Vitamins are a specific class of nutrients that are required for efficient metabolic processes and enable cattle and buffaloes to utilize other nutrients. For ruminants, it is only essential to supply the fat-soluble vitamins i.e Vitamin A, D

and E because rumen bacteria can synthesize vitamin K and the B vitamins to meet animal requirements. The fat-soluble vitamins can be stored in the body.

Functions of different Minerals in animal body:

- **Calcium (Ca)** : Required for development and formation of bones and teeth. Helps in clotting of blood. Essential for milk production. Required for contraction of muscles. Deficiency causes milk fever in high yielding animals immediately after parturition.



- **Magnesium (Mg)** : Important for integrity of bone and teeth . Involved in protein synthesis and metabolism of carbohydrates and lipids and plays important role in muscle contraction.
- **Sodium, Potassium and Chloride:** All required for maintenance of osmotic pressure and acid base equilibrium. Potassium helps in contraction and relaxation of heart. Potassium is necessary for protein synthesis in tissues.
- **Sulphur (S):** Required for protein synthesis and metabolism of carbohydrates and lipids. Sulphur is part of B-Complex

vitamins, thiamine and biotin.

- **Copper (Cu):** Required for haemoglobin synthesis and for tissue pigmentation and normal reproduction functions.
- **Zinc (Zn)** : Required for spermatogenesis and development of primary and secondary sex organs . Deficiency causes skin disorders like rough hair coat, loss of hair etc.
- **Iodine (I):** Required for synthesis of thyroid hormones (T3 and T4). Necessary for reproduction and growth of animals.
- **Cobalt (Co):** Required for the synthesis of Vitamin B12 by the rumen microbes. Essential for haemoglobin synthesis.
- **Phosphorus (P)** Essential for milk production and required in energy metabolism. Required for formation of bones and teeth. Required for regularity of oestrous cycle and maintenance of fertility. In deficiency, animals eat other than feed and fodder like wood, plastic, bone, wire etc.



Functions of different vitamins:

- **Vitamin A:** Required to maintain normal vision and maintenance of epithelial tissues such as skin and lining of the respiratory, digestive and reproductive tracts to keep animals in healthy conditions. It also plays important role in maintaining proper kidney function and normal developments of bones, teeth and nervous tissues. In the breeding herd , Vitamin A is required for normal maintenance of pregnancy in cow and spermatogenesis in bull. Night blindness is a classical symptom of vitamin A deficiency .other signs of deficiency in growing cattle include low intakes, lethargic movements, reduced daily gains and feed efficiency but most of such symptoms are common in other diseases or deficiencies may not be easily recognised as a vitamin deficiency.



- **Vitamin D:** Vitamin D is formed by the action of sunlight or other sources of ultraviolet light rays upon certain sterols. If cattle have exposure to sunlight, or harvested hay, deficiency is seldom an issue. Young, growing animals have a greater requirement for vitamin D than mature animals. Vitamin D helps regulate blood calcium levels and the conversion of inorganic to organic phosphorus. It also aids in the formation of sound bones and teeth.