MJF COLLEGE OF VETERINARY & ANIMAL SCIENCES, CHOMU, JAIPUR (RAJ.)

DEPARTMENT OF ANIMAL NUTRITION

IMPORTANCE OF MAJOR MINERALS
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Introduction

Minerals play important roles in physiological, structural and regulatory functions within the animal body.

Types Macro-Minerals

- Calcium(Ca)
- Phosphorus(P)
- Sulphur(S)
- Magnesium(Mg)
- Sodium(Na)
- Chlorine (Cl)
- Potassium (K)

1. C alcium (C a)

Function

- Skeletal growth
- Teeth formation
- Transmission of nerve impulses
- Muscle contraction
- Enzyme activation
- Controls heartbeat
- Blood clotting
- Hormone secretion

Deficiency Indicators

- Osteomalacia
- Rickets
- Milk fever (hypocalcaemia)
- Reduced and depraved appetite
- Weight loss
- Growth retardation
- Reduced fertility
- Bone demineralisation (Big Head in horses)

2. Phosphorus (P)

Function

- Involved in almost all metabolic reactions
- Bone and tooth formation and maintenance
- Enzyme formation
- Amino acid, carbohydrate and fat metabolism
- Involved in sugar digestion and energy production
- Muscle building
- Genetic transmission
- Acid base balance

Deficiency Indicators

- Depraved appetite (bone chewing)
- Weakness
- Demineralisation of bone
- Poor appetite, growth and feed conversion
- Loss of calcium
- Reduced fertility (failure to show oestrus)
- Low conception rates), Reproductive failure
- Dull, dry hair/coats
- Disturbance of energy metabolism
- Reduced milk yield

3. Sulphur (S)

Function

- Formation of amino acids
- Detoxifier
- Important for the manufacture of microbial protein
- Involved with carbohydrate metabolism
- Involved in connective tissue
  Involved with energy metabolism
- Part of haemoglobin
- Part of energy regulation

Deficiency Indicators

- Related to protein deficiency
- Slow growth
- Reduced feed intake, digestibility and microbial protein synthesis
- Poor wool growth
- Wool and hair shedding
- Weakness

4. Magnesium (Mg)

Function

- Required for growth, repair of body tissues
- Bone and teeth integrity
- Fat, protein and carbohydrate metabolism
- Enzyme activation
- Neuromuscular activity
- Cell respiration
- Involved in hormonal activity
- Relaxes nerve impulses
- Increases rumen pH and can help increase milk yield and butterfats

Deficiency Indicators

- Grass Tetany (Hypomagnesaemia)
- Hyper-irritability
- Retarded growth
- Convulsions
- Reduced feed intake
- Anorexia
- Muscular incoordination
- Excessive calcification of bone and fat tissue

5. Sodium (Na)

Function

- Osmotic balance
- Electrolyte essential for acid-base balance
- Muscle/cell formation

- Transmission of nerve impulses
- Necessary for muscle and heart contraction
- Involved in appetite
- Involved in body water regulation
- Enables more efficient utilisation of digested protein and energy

Deficiency Indicators

- Poorfeed conversion
- Reduced reproductive efficiency
- Loss of appetite and weight loss Ill thrift
- Rough coat and lack lustre eyes
- Reduced water intake
- Skin dehydration
- Incoordination of muscles and collapse

6. Chlorine (Cl)

Function

- Maintain osmotic pressure and body fluid balance
- Acid-base balance
- Regulation of water balance
- Involved in respiration and regulation of blood pH
- Involved in producing gastric juice and stomach pH
- Found in large concentrations within and without the cells of body tissues
- Activation of enzymes

Deficiency Indicators

- Alkalosis resulting in slow shallow breathing
- Muscle cramps
- Reduced food intake
- Dehydration
- Lower milk production
- Poor growth Convulsions

7. Potassium (K)

Function

- Nerve and muscular function
- Digestion of food
- Fluid transport
- Osmotic balance
- Hormone release
- Embryonic development
- Acid-base balance
- Enzyme activation
- Water balance

Deficiency Indicators

- Reduced appetite
- Reduced growth
- Dehydration
- Muscle weakness
- Nervous disorders
- Cardiac weakness
- Diarrhoea (common cause of deficiency)

Thank You