MINERAL MIXTURE IN ANIMAL FEED FOR BALANCE NUTRITION AND ENHANCED ANIMAL PRODUCTIVITY

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INTRODUCTION

Minerals are vital components of animal nutrition which required by dairy animals for their metabolic functions, growth and development, higher milk production, reproduction and health. There are fifteen minerals which are essential in the animal system for proper health and functioning of animal body. Out of these fifteen elements, seven are major (Calcium-Ca, Phosphorus-P, Sulphur-S, Sodium-Na, Magnesium-Mg, Chlorine-Cl and Potassium-K) and eight are trace elements (Iron-Fe, Copper-Cu, Cobalt-Co, Manganese-Mn, Molybdenum-Mo, Iodine-I and Zinc-Zn). Animal cannot synthesize minerals inside its body and usually feeds and fodders fed to the dairy animals do not provide all the minerals in the required quantity. Therefore, animals should be provided with adequate and balanced amount of good quality minerals in their ration. Supplementation of bio-available minerals through mineral mixture products (which are easily available in the market at affordable rate) is of paramount importance and their supply from external sources is utmost crucial for better animal health and optimum productivity.

FUNCTIONS OF MINERAL ELEMENTS IN ANIMAL SYSTEM:

•The major minerals provide structural and electrolytic support while the trace elements influence reproduction system, appetite, immune competency.
•Minerals governs resistance of animals to various diseases such as alimentary osteodystrophy, pasture tetanus, rachitis, osteoporosis, osteoarthrosis, anemia, parakeratosis, retarted growth, reproductive failure and reduction in immunity.
•Minerals are vital for proper growth and development of animal system. There sufficiency and balanced supply is vital for proper functioning of digestive system, respiratory system, reproductive system in the animals as a component of enzymes and hormones.
•Minerals are essential constituents of skeletal structures such as bones and teeth.
•Minerals play a key role in the maintenance of osmotic pressure, and thus regulate the exchange of water and solutes within the animal body.
•Minerals serve as structural constituents of soft tissues.
•Minerals are essential for the transmission of nerve impulses and muscle contraction.
•Minerals play a vital role in the acid-base equilibrium of the body, and thus regulate the pH of the blood and other body fluids.
•Minerals serve as essential components of many enzymes, vitamins, hormones, and respiratory pigments, or as cofactors in metabolism, catalysts and enzyme activators

BENEFITS OF FEEDING MINERAL MIXTURES:

•Improves growth rate of calves, hence early puberty
•Improves reproduction efficiency in male and female animals
•Reduce inter-calving period leading to more productive life of animals
•Improves efficiency of feed utilization
•Improves milk production and SNF content of the milk
•Better immune response; hence better resistance against diseases

FEEDING RECOMMENDATION

Mineral mixture can be fed by mixing it with concentrate mixture or by mixing 15-20 gm common salt to it. Usually, compound cattle feed contains mineral mixture at varying levels; however, additional requirement can be met by mixing it with feed. General recommendation for feeding dose of mineral mixture is as following:

S.N	Category of animals	Recommended dose
1	Calves	20-25 g per animal daily
2	Heifers and dry animals	50 g per animal daily
3	Milking Animals	100-200 g per animal daily

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AREA SPECIFIC MINERAL MIXTURES:

Mineral mixture ingredients and composition may not be uniform for all the regions. They depend upon various factors such as quality and nutritional composition of fodder and feed materials available in the region hence; it varies from state to state. For the preparation of mineral mixture for the state of Uttar Pradesh, Madhya Pradesh and Rajasthan, following ingredients and specifications are recommended:

S.N.	Ingredients/characteristics	Requirement
1	Moisture (%), Max.	5.0
2	Calcium (%), Min.	27.5
3	Phosphorus (%), Min.	9.0
4	Copper (%), Min.	0.2
5	Zinc (%), Min.	1.2
6	Manganese (%), Min	0.3
7	Cobalt (%), Min.	0.01
8	Iodine (%), Min.	0.02
9	Fluorine (%), Max.	0.05
10	Acid insoluble ash (%), Max.	3.0
11	Lead (ppm), Max.	20.0
12	Arsenic (ppm), Max.	7.0

CONCLUSION:

Minerals are vital components of animal nutrition which required by dairy animals for their metabolic functions, growth and development, higher milk production, reproduction and health. Animal cannot synthesize minerals inside its body and usually feeds and fodders fed to the dairy animals do not provide all the minerals in the required quantity. Therefore, animals should be provided with adequate and balanced amount of good quality minerals in their ration. Supplementation of bio-available minerals through mineral mixture is of paramount importance and their supply from external sources is utmost crucial for better animal health and optimum productivity.