

# **ANIMAL MACRO NUTRIENT DEFICIENCIES**

NUTRIENT	FUNCTIONS	DEFICIENCY SYMPTOMS
<b>Sodium (Na)</b>	Maintains osmotic pressure and acid-base balance of body fluids which in turn regulates nutrient transfer, waste removal and water balance in body tissue. Plays a role in muscle contraction and in the production of bile.	<ul style="list-style-type: none"> <li>§ Reduced growth and feed utilisation</li> <li>§ Reduced milk production</li> <li>§ Weight loss in adults</li> <li>§ Infertility in males</li> <li>§ Delayed sexual maturity in females</li> <li>§ Craving for sodium (e.g. drinking urine)</li> <li>§ In laying hens – lower egg production, weight loss and cannibalism.</li> </ul>
<b>Chlorine (Cl)</b>	Maintains osmotic pressure and acid-base balance of body fluids. Component of gastric juice (hydrochloric acid).	<ul style="list-style-type: none"> <li>§ Retarded growth</li> <li>§ Chloride deficient chicks exhibit noise induced nervous systems.</li> </ul>
<b>Calcium (Ca)</b>	Bone and teeth development. Nerve function, muscle contraction and blood coagulation. Cell permeability. Milk production and development of egg shells in poultry.	<ul style="list-style-type: none"> <li>§ Rickets in young</li> <li>§ Osteomalacia in adults</li> <li>§ Tetany e.g. milk fever in cows</li> <li>§ In hens – thin shelled eggs, reduced egg production and lower hatch rates.</li> </ul>
<b>Phosphorous (P)</b>	Bone and teeth development. Is a constituent of phospholipids required for lipid transport, metabolism and cell membrane structure and RNA and DNA required for protein synthesis. Also a component of several enzyme systems.	<ul style="list-style-type: none"> <li>§ Rickets in young</li> <li>§ Osteomalacia in adults</li> <li>§ Depraved appetite (pica)</li> <li>§ Breeding and urinary problems</li> <li>§ In hens, reduced egg production.</li> </ul>
<b>Magnesium (Mg)</b>	Essential for normal skeletal development. Is a constituent of bone and functions as an enzyme activator in the glycolytic system. Helps decrease tissue irritability.	<ul style="list-style-type: none"> <li>§ Flushing of the skin due to vasodilation</li> <li>§ Hyperirritability e.g. Tetany, loss of appetite, hyperemia, convulsions and death.</li> </ul>
<b>Potassium (K)</b>	Major cation of intracellular fluid that regulates osmotic pressure and acid-base balance. Plays a role in muscle activity, carbohydrate metabolism and enzyme reactions involving creatine.	<ul style="list-style-type: none"> <li>§ Retarded growth, muscle weakness, unsteady gait, pica, diarrhoea, distended abdomen, emaciation followed by death.</li> </ul>
<b>Sulphur (S)</b>	Constituent of cystine and methionine (amino acids), biotin (for lipid metabolism), thiamine (for carbohydrate metabolism) and coenzyme A (for energy metabolism).	<ul style="list-style-type: none"> <li>§ Retarded growth due to insufficient protein synthesis</li> <li>§ Sheep may experience reduced wool growth.</li> </ul>