

Table 2-1: Mineral Requirements and Tolerance Levels in Livestock

Mineral	Species	Beef Cattle				Dairy Cattle				Swine				
		Production Stage	Requirement			Maximum Tolerable Level	Requirement			Maximum Tolerable Level	Requirement			Maximum Tolerable Level
			Growing/Finishing	Gestation	Lactation		Lactation	Dry Cow	Growing Heifers/Bulls		Mature Bulls	Gestation	Lactation	
Calcium	%				2.00	0.43 – 0.77	0.39	0.29 – 0.52	0.30	2.00	0.75	0.75	0.75	
Chlorine	%					0.25	0.20	0.20	0.20		0.12	0.16	0.12	
Cobalt	ppm	0.10	0.10	0.10	10.00	0.10	0.10	0.10	0.10	10.00				400.00
Copper	ppm	10.00	10.00	10.00	100.00	10.00	10.00	10.00	10.00	100.00	5.00	5.00	5.00	250.00
Iron	ppm	50.00	50.00	50.00	1000.00	50.00	50.00	50.00	50.00	1000.00	43.00	15.00	40.00	600.00
Magnesium	%	0.12	0.12	0.20	0.40	0.20 – 0.25	0.16	0.16	0.16	0.50	0.04	0.04	0.04	0.30
Manganese	ppm	20.00	40.00	40.00	1000.00	40.00	40.00	40.00	40.00	1000.00	10.80	3.81	10.00	500.00
Molybdenum	ppm				5.0					10.00				
Phosphorus	%				1.0	0.28 – 0.48	0.24	0.23 – 0.31	0.19	1.00	0.60	0.60	0.60	
Potassium	%	0.60	0.60	0.70	3.00	0.90 – 1.00	0.65	0.65	0.65	3.00	0.20	0.20	0.20	2.00
Selenium	ppm	0.10	0.10	0.10	2.00	0.30	0.30	0.30	0.30	2.00	0.08	0.03	0.07	5.00
Sodium	%	0.06 – 0.08	0.06 – 0.08	0.10		0.18	0.10	0.10	0.10		0.15	0.20	0.15	
Sulfur	%	0.15	0.15	0.15	0.40	0.20 – 0.25	0.16	0.16	0.16	0.40				
Zinc	ppm	30.00	30.00	30.00	500.00	40.00	40.00	40.00	40.00	500.00	27.00	9.52	25.00	2000.00

Mineral	Species	Sheep			Goats		Horses			Chickens		
		Production Stage	Requirement		Maximum Tolerable Level	Requirement	Maximum Tolerable Level	Requirement		Maximum Tolerable Level	Maximum Tolerable Level	
			Mature Ewe	Lamb				Maintenance	Growth		Immature	Adult
Calcium	%	0.25 – 0.40	0.55	1.50	0.03-0.80	1.50						
Chlorine	%			4.00		4.00	0.50 - 1.00	0.50 – 1.00			0.70	4.00 – 6.00
Cobalt	ppm	0.10 – 0.20	0.10 – 0.20	25.00	0.10 - 0.15	25.00	0.10	0.10	25.00	100.00		
Copper	ppm	10.00	10.00	15.00	10.00-25.00	40.00	9.00	9.00	250.00	250.00		
Iron	ppm	40.00	40.00	500.00	35.00 – 95.00	500.00	40.00	50.00	500.00	4500.00		
Magnesium	%	0.12 – 0.18	0.12	0.60	0.18-0.40	0.60	0.09	0.10	0.80	0.57	1.12	
Manganese	ppm	40.00	40.00	2000.00	40.00-1000.0	2000.00	40.00	40.00	400.00	4000.00		
Molybdenum	ppm	0.50	0.50	5.00	0.10 – 1.00	1000.00				350.00	500.00	
Phosphorus	%	0.20 – 0.30	0.25	0.60	0.25-0.40	0.60						
Potassium	%	0.50 – 0.80	0.60	2.00	0.80-1.50	2.00	0.40	0.50	1.00			
Selenium	ppm	0.30	0.30	5.00	0.10-20.00	5.00	0.10	0.10	5.00	10.00	5.00	
Sodium	%	0.10 – 0.15	0.10		0.20		0.35	0.35		0.89	1.20	
Sulfur	%	0.15 – 0.25	0.15	0.30 – 0.50	0.20-0.30	0.30 – 0.50	0.15	0.15	0.50			0.81
Zinc	ppm	30.00	30.00	300.00	40.00-500.00		40.00	40.00	500.00			800.00

All values on mineral table are taken from National Research Council (NRC) resources.

Mineral requirements for horses vary by purpose, activity level, age group and sex; for more detailed information, please refer to the NRC Requirements of Horses.

Mineral requirements for poultry vary by species, breed and production purposes; for more detailed information, please refer to the NRC Nutrient Requirements of Poultry.

Mineral requirements for sheep and goats vary by production stage, weight, and breed type; for more detailed information, please refer to the NRC Nutrient Requirements of Small Ruminants.