



# NUTRENT CHART

<u>NUTRENT</u>	<u>FUNCTION</u>	<u>APPLICATION</u>	<u>REQUIRED/DAY</u>	<u>SOURCES/EXTRACTIONS</u>	<u>DEFICIENCY</u>	<u>SIGNS</u>
Calcium <small>macro/min</small>	Bone, joint, muscle contraction, heart muscle, GI motility, nerve function, several metabolic processes	Overall health and development		H calcium combined with zinc, iron, copper, Mg, manganese Ca:P ratio approx 2:1	Poor bone/joint development, osteoporosis	Rare
Phosphorus <small>macro/min</small>	Energy metabolism, DNA formation, protein formation, bone	Health/development		Competes with calcium for absorption	Muscle weakness, low energy, bone disease	Calcium deficiency
Magnesium <small>macro/min</small>	Muscle strength/relaxation/contraction, nerve function, metabolism of carbohydrates and protein	Behavior, muscle relaxation, prevent cramping	0.015g/kg body weight	Calcium needs magnesium in order to function properly	Nervousness, tremors, sensitive to touch, tight muscles	Not recognized
Sodium <small>macro/min</small>	Nerve signals, regulates body pH and body fluids, transports nutrients across cell membranes		about 1.7 g/kg dry feed		Rare, itching, decreased drinking, poor skin quality, low appetite	Very rare, excreted through urine
Potassium <small>macro/min</small>	Skeletal muscle (including heart) function, body pH, body fluid regulation, potassium ion channels		0.05g/kg body weight		Rare, possible with excessive sweating	Excreted through urine
Chloride <small>macro/min</small>	Component of bile for digestion, body pH, body fluid regulation			Comes with salt (NaCl, KCl)	Rare	Rare
Vitamin A <small>macro/min</small>	Vision, embryo development, immune system	Overall health, breeding	Adult 15,000 IU Growth 45 IU/kg Broodmare 30,000 IU	H amount in pasture, low amount in mature hay	Impaired growth, night blindness if severe	Never reported
Vitamin D3 <small>macro/min</small>	Interacts with gut, kidney, and bone to regulate amounts of calcium in body	Health/development	Adult approx 1300 IU don't exceed 22,000 IU	Body makes it when exposed to sunlight	Poor growth and development, (when lack exposure to sun)	Poor growth and development
Vitamin E <small>macro/min</small>	Antioxidant, prevents cellular damage	Suppleness, rideability	Approx. 500IU	Need supplementation especially if not on pasture	Poor function of skeletal and cardiac muscle, neuromuscular disease	Not recognized
Copper <small>macro/min</small>	Connective tissue, growth, iron regulation, melanin, red blood cell formation, nervous system function	Health, musculoskeletal development	10mg/kg dry matter	Absorption can be decreased by zinc, amounts in diets vary	Bone/joint problems, poor coat color, embryo loss, poor skin/hair/hooves	Rare
Zinc <small>macro/min</small>	Connective tissue, insulin function, blood clotting, wound healing, fertility	Helps immune system	40mg/kg dry matter	Found in most diets, Cu to Zn ratio should be approx 1:1	Rare, hair loss, poor appetite, poor fertility	Copper deficiency
Iron <small>macro/min</small>	Oxygen transport in blood and muscle	Athletic performance	40mg/kg dry matter	Found in most diets	Rare, anemia	Foals susceptible, zinc deficiency in adults
Manganese <small>macro/min</small>	Connective tissue, bone, carb and lipid metabolism, it is part of chondroitin sulfate, immune system				Rare, abnormal horse/skin/hair/joints	Rare
Selenium <small>macro/min</small>	Antioxidant, aids thyroid hormone, protects muscle cells	Optimal muscle function for performance	1-5mg	Works with vitamin E	Muscle/joint disease, respiratory distress, poor sucking	Hair loss, hoof cracks, colic, diarrhea, blind staggers
Methionine <small>macro/min</small>	Hoof growth, helps liver metabolize fat, essential for selenium bioavailability, coat quality	Hoof quality, build muscle	approx 3g	Essential body cannot make it; limiting other a/s dependent is found in hi protein hays, beet pulp	Poor coat, poor hoof quality	Rare
Lysine <small>macro/min</small>	Muscle development, fat metabolism, immune system	Build muscle	approx 10-20g	Essential/limiting, found in hi protein hays	Poor hoof, hair, topline, abnormal limb development	
Theonine <small>macro/min</small>	Growth, feed efficiency, production of adrenaline, precursor to thyroid hormone		approx 2-4g	Essential/limiting	Poor growth, poor condition	
*B vitamins water soluble and need to be consumed daily, not stored in body*						
B1 Thiamine <small>macro/min</small>	Carbohydrate metabolism, nervous system metabolism	B vitamins boost metabolism and energy levels		Found commonly in equine diet, in most grains	Rare, weak muscles, fatigue, low appetite, slow heart, muscle twitching, ataxia, beriberi	Not recognized
B2 Riboflavin <small>macro/min</small>	Coenzyme precursor, coenzymes essential for many life processes, feed digestion, nervous sys metabolism			Found in alfalfa and grass hay	Rough coat, poor skin, light sensitivity	Not recognized
B6 Pyridoxine <small>macro/min</small>	Fat, carb, protein metabolism, nervous system metabolism			common in diet	Not reported	Not reported
B12 Cyanocobalamin <small>macro/min</small>	Carb and fat metabolism, protein synthesis DNA and RNA, energy production, nervous system			Made in digestive tract by a process that requires cobalt	Not reported	Not reported
B5 Pantothenic acid <small>macro/min</small>	Carbohydrate/lipid metabolism, hormones, neurotransmitters, hemoglobin, porphyrins			Common in diet	Not reported	Not reported
B3 Niacin <small>macro/min</small>	Carb/fat/lipid metabolism, energy production	Energy generation		Common in diet, also made in gut	Not reported	Not reported
B9 Folic Acid <small>macro/min</small>	Creation of DNA, creation of methionine			In alfalfa, timothy, less so in grain, made in gut, fresh grass	Not reported in horse unless on Pyrimethamine and Sulfadiazine for EPM	Not reported
Vitamin K3 <small>macro/min</small>	Blood clotting, bone, heart			Found in forage	Rare, clotting issues	Not reported
Cobalt <small>macro/min</small>	Precursor to B12			Becomes V B12 when converted in the gut, abundant in diet	Not reported	Not reported
B7 Biotin <small>macro/min</small>	Hoof, skin, coat, carbohydrate metabolism, thyroid, adrenal, reproductive, nervous system	Hoof quality	5/25mg 15mg or more to aid poor hoof quality	Highest in pasture, also found in hay, can be made in gut	Not reported	Not reported
Vitamin C Ascorbic acid <small>macro/min</small>	Antioxidant prevents cell damage, helps build collagen		0.01g/kg	Unknown amount in typical equine diet, horse makes it from glucose	Not reported	Not reported
B4 Choline <small>macro/min</small>	Aids fat metabolism in liver, cell membrane health, antioxidant, nerve function			Abundant in forage and grains	Not reported	Not reported
Endolevonic <small>macro/min</small>	Plant derived antioxidants			From citrus fruits	Not reported	Not reported
Carotene <small>macro/min</small>	Precursor to vitamin A			Found in plants	Not reported	Not reported
L-tryptophan <small>macro/min</small>	Building block for serotonin which determines a positive mood	Behavior/nervousness	Not determined	Essential amino acid must acquire from diet, common in diet	Exhibitability, poor overall condition	Not reported
Carnitin <small>macro/min</small>	Energy metabolism and development	Support during exertion, PSSM, insulin resistance		Made in body, found in muscle	Not reported	Not reported
B8 Inositol <small>macro/min</small>	Interacts with serotonin, facilitates absorption of vitamin E	Behavior/nervousness			Not reported	Not reported
Omega 3 fatty acids <small>macro/min</small>	Antiinflammatory, immune sys, nervous sys, cell health, can decrease inflammation	Sweet itch, arthritis, sperm production, respiratory allergies	Omega 3 to 6 ratio of approx 10:1 said to be ideal	Fresh grass, flaxseed, converted to EPA and DHA in body. Essential- they must get from diet		
Omega 6 fatty acids <small>macro/min</small>	Inflammatory; needed, but at a lower level than 3's blood pressure, hormones/prostaglandins, cell health, smooth muscle function			Found in oils of seeds and grains; too much grain can tip ratio of 3 to 6	Inflammation in body	
Beta glucan <small>macro/min</small>	Helps formation of immune cells (production and activation of macrophages)	Infection, allergy, optimize response to vaccine, give to mare to boost fetal immunity, sarcoid, wounds		Found in cell walls of bacteria, yeast, and fungi, cereals		
Sulfur <small>macro/min</small>	Strengthens collagen, tendons, cartilage, component of biotin, insulin, chondroitin, amino acids, diamine		0.1% of dry matter intake, requirement not established	Found in plant proteins	Not reported	Not reported
Algae <small>macro/min</small>	Hg content omega 3, B vitamins, amino acids, minerals			Harvested from various waters		
Silicon <small>macro/min</small>	Bone formation, collagen			In some forages depending on soil content, not all forms are bioavailable to horse		
Chromium <small>macro/min</small>	Assists insulin, helps to clear glucose from blood	Cushings, insulin resistance	5-15 mg ? Not known			
Iodine <small>macro/min</small>	It makes up part of thyroid hormone (T3 and T4)	Thyroid, fetal health, mare fertility		Varied in diet, depends on soil content of feed source, mineral blocks	Colic, weak foal	Colic, weak foals, stillborn, poor cycling in mares