

TOTAL CHILDREN'S CHEWABLE

Ingredients: Each chewable tablet contains: Vitamin A 2500 i.u., Vitamin C (from the sago palm) 100 mg, Vitamin B-1 1.5 mg, Vitamin B-2 1.7 mg, Vitamin B-6 2 mg, Vitamin B-12 6 mcg, Vitamin D3 200 i.u., Vitamin E (as succinate) 30 i.u., Niacin 1 mg, Folic Acid 30 mcg, Biotin 50 mcg, Pantothenic Acid (as D-Calcium Pantothenate) 10 mg, Iodine (as dulse) 100 mcg, Calcium (as chelate) 20 mg, Iron (as peptonate) 850 mcg, Magnesium (as chelate) 10 mg, Zinc (as chelate), 500 mcg, Selenium (as chelate) 2 mcg, Copper (as chelate) 50 mcg, Manganese (as chelate) 50 mcg, Potassium (as chelate) 200 mcg, Niacinamide 5 mg, Bromelain 10 mg, Lactobacillus Acidophilus 2 million units, Lactobacillus Bulgaricus 2 million units, Lactobacillus Bifidus 2 million units, Papaya (fruit) 10 mg, Flax Seed Fiber 25 mg.

Supportive Function: Proper growth and development; enhancement of immune function; strong bones, muscles and connective tissue; maintenance of healthy organ systems in the body.

When is vitamin and mineral support helpful? Vitamins and minerals are vital to all biochemical functions in the body, and therefore are helpful in most things related to health; beneficial in impaired immune status and vitamin/mineral deficiencies.

Clinical Applications/Research: Vitamin A is necessary for cell growth and repair, and as such is an essential nutrient for growing children. It contributes to strong, efficient immune cells, and helps to build strong bones and teeth. Vitamin A is also important for good eyesight (visual acuity is determined to a large degree in early childhood). Deficiencies can be manifested in night blindness, sinus problems, dry, scaly skin, acne, and frequent infections, among other conditions. The importance of vitamin A for early development is emphasized by a study conducted by the National Institute of Child Health and Human Development Neonatal Research Network. A randomized trial showed that vitamin A supplementation reduced bronchopulmonary dysplasia (abnormal cells in the lungs) or death in extremely low birth weight babies (Ambalavanan N, et al. Vitamin A supplementation for extremely low birth weight infants: outcome at 18 to 22 months. Pediatrics. 2005 Mar;115(3):e249-54).

Vitamin C is necessary for a lot of processes, but it is most widely known for its integral function in the development of collagen (strong tissues) and its effect on the immune system. It is a powerful antioxidant and protects cells from oxidative destruction. Typical overconsumption of carbonated drinks can crowd out much needed fruits and vegetables from the diet that provide a good source of vitamin C.

Eating inadequate amounts of fresh fruit or vegetables can cause symptoms of asthenia (lack of energy), weak blood vessels, bleeding, and gum abnormalities. Musculoskeletal symptoms can consist of arthralgia, myalgia, hemarthrosis (blood in a joint or synovial cavity), and muscular hematomas. Vitamin C depletion is responsible for structural collagen alterations, defective bone matrix formation, and increased bone resorption.

Imaging studies may show osteolysis, osteoporosis, joint space loss, bone cell death, and osteopenia. Children can experience severe lower limb pain related to subperiosteal bleeding (bleeding under the periosteum, specialized connective tissue covering all bones).

Vitamin D increases calcium absorption and is necessary for proper bone and tissue growth. It is also being studied for its beneficial effects on the immune system and its role in preventing some autoimmune diseases. Studies show that **a significant proportion of healthy children present with values below the threshold, indicating an insufficient vitamin D status** (Garabedian M, et al. Arch Pediatr. 2005 Apr;12(4):410-419). There is also considerable evidence that vitamin D, which is important for nerve growth factor (NGF) has a substantial effect on the developing brain, and that low levels can interfere with that development. In fact, some researchers “conclude that transient **early life low levels of vitamin D not only disrupt brain development but lead to persistent changes in the adult brain**” (Feron F, et al. Developmental Vitamin D(3) deficiency alters the adult rat brain. Brain Res Bull. 2005 Mar 15;65(2):141-8). The American Academy of Pediatrics (AAP) has recommended a **minimal intake of 200 IU/d vitamin D for all infants, beginning in the first 2 mo of life.**

Vitamin E increases cell membrane flexibility, is a powerful antioxidant and cell protector, strengthens capillary walls, and has many health benefits. Deficiency of vitamin E can manifest in many ways, including eczema and a weakened immune system. It is believed that levels of **antioxidant vitamins and other elements may be important in the prevention and treatment of chronic rhinosinusitis in children** (Unal M, et al. Serum levels of antioxidant vitamins, copper, zinc and magnesium in children with chronic rhinosinusitis. J Trace Elem Med Biol. 2004;18(2):189-92). The other elements included **vitamin C, copper and zinc.**

The **B vitamins** are water-soluble, necessary for many biochemical reactions, and are **essential for energy, mental well-being, and the health of hair, skin, eyes, mouth, liver, etc.** Most of them are made by the intestinal flora of the gut. They are particularly important for nervous system function and adrenal/thyroid glands in infants/children. They are destroyed by heat and microwaving, making it even more difficult to extract them from food. Stress and sugar are both notorious for robbing the body of necessary B vitamins. **Vitamin B-1 (thiamine)** is associated with proper growth and energy production in children, and contributes to normal Hcl production. **Vitamin B-2 (riboflavin)** is important for the production of two Co-enzymes that are essential to many reactions, including metabolism of food macronutrients, energy production, and normal cell growth. **Vitamin B-6 (pyridoxine)** is especially correlated with normal function of the nervous system, fluid balance, and synthesis of red blood cells, antibodies, and DNA. Vitamin B-6 can lower homocysteine levels, a toxic substance that is increasingly noticed in children, and indeed, “Risk factors established at young ages may set the stage for later cardiovascular disease (CVD)” (Papoutsakis C, et al. Plasma homocysteine concentrations in Greek children. J Nutr. 2005 Mar;135(3):383-8). **Folic acid** is needed for all dividing cells (especially RNA/DNA), it helps prevent neural tube birth defects, and it also lowers homocysteine levels. **Vitamin B-12** is also essential to nervous system and energy function, and lowers homocysteine levels, too. Deficiencies in folic acid or vitamin B-12 can manifest in anemias. **Vitamin B-3 (niacin)** is necessary for the production of two Co-enzymes that are involved in over 50 reactions, ranging from digestion to energy production. Low levels can contribute to weakness, dermatitis, skin eruptions, and a whole host of other

symptoms. **Biotin** is a Co-enzyme that helps with the utilization of vitamin B-12, folic acid, and pantothenic acid. It is critical for the synthesis of RNA/DNA and the metabolism of fat, protein and carbohydrate. **Pantothenic acid (vitamin B-5)** is part of a Co-enzyme called "Co-A"; it is especially vital to optimal adrenal activity, healthy skin and nerves, and is known as one of the major "anti-stress" vitamins.

Calcium is necessary for many enzymes to be activated; it is important for muscle contraction, nerve transmission, and blood clotting, and 99% of body calcium is concentrated in the bones and teeth. Approximately **50% of the calcium in adult bones is laid down during adolescence**, so this is a critical time period for calcium intake. Deficiencies can cause muscle cramps, joint aches, nervous disorders, colitis, kidney stones, brittle nails, etc.

Magnesium increases the solubility of calcium. It is present as a cofactor in many enzymes, especially in energy production. It plays an important role in muscle contraction-relaxation, regulates pH and body temperature, it is **essential for rebuilding after injury, and it gets depleted in inflammatory states**. Magnesium is so important to bone strength that magnesium alone is able to suppress bone turnover, and improve the risk profile for osteoporosis (Dimai, H.P., et al. Daily oral magnesium supplementation suppresses bone turnover in young adult males. *Journal of Clinical Endocrinology and Metabolism*, Vol. 83, August 1998, pp. 2742-4).

Zinc is critical for **normal growth and development**. Zinc can enhance immune status, possibly by preventing infection and/or by improving the ability of the immune system to get rid of an infection (Sazawal, S. et al. Zinc supplementation reduces incidence of acute lower respiratory infections in infants and preschool children: double-blind, controlled trial. *Pediatrics* 1998;102:1-5; Prasad AS et al. *Ann Intern Med* 2000;133:245-52). Zinc supplements have even been shown to reduce childhood morbidity in populations in whom zinc deficiency is common (Penny ME, et al. Randomized controlled trial of the effect of daily supplementation with zinc or multiple micronutrients on the morbidity, growth, and micronutrient status of young Peruvian children. *Am J Clin Nutr.* 2004 Mar;79(3):457-65). "There is evidence that zinc supplementation may be of benefit in children with an above average risk of lead poisoning" (Schmitt, N, MD. *Canadian Medical Association Journal.* January 1, 1996;154:13-14).

Selenium is essential for normal **functioning of the immune system and thyroid gland** (also essential for the synthesis of active thyroid hormone), and is part of an antioxidant enzyme that protects cells in the body from oxidative damage. Gastrointestinal disorders may decrease the absorption of selenium, resulting in selenium depletion or deficiency. Adequate selenium intake is associated with decreased risk for many cancers. Most soils are devoid of selenium.

Copper helps **release energy, aids the thyroid gland, carries oxygen in the blood stream** and supplies the body's tissues with oxygen, aids in nerve and brain function, acts as a component in enzymes (including antioxidant enzymes), and improves levels of neurotransmitters such as epinephrine, norepinephrine and dopamine. Low copper causes the cells to suffocate and lack oxygen. Low levels can cause low levels of HDL cholesterol, skin problems, swollen ankles and anemia, among other things. **Low copper levels are also linked to low enkephalins (endorphins)** produced in the brain. Endorphins make us feel good and combat depression.

Manganese is an essential trace mineral that aids in the formation of connective tissue, bones, blood-clotting factors, and plays a role in fat and carbohydrate metabolism, calcium absorption, and blood sugar regulation. Manganese is also necessary for normal

brain and nerve function. Manganese is a component of an antioxidant enzyme that protects cells from oxidative damage. Low levels of manganese in the body can contribute to bone malformation, weakness, and seizures.

Iron is an essential mineral that is needed in children for proper oxygen delivery in the blood. Deficiencies of it can cause anemia, and are suspected of causing abnormal dopamine neurotransmission and may contribute to attention-deficit/hyperactivity disorder (ADHD) (Eric Konofal, MD, Ph.D., et al. Iron deficiency in children with Attention-deficit/hyperactivity disorder. *Arch Pediatr Adolesc Med.* 2004;158:1113-1115).

Papaya is a fruit rich in phytochemicals and vitamins A & C. Papaya has long been used traditionally as an anti-phlegmatic, digestive, anti-flatulent, diuretic, vermifuge, pyretic (temperature regulation) and a general tonic. It is rich in papain, a helpful digestive enzyme, and lends a pleasant tasting flavor to the chewable tab.

Flax Seed Fiber provides much needed fiber for intestinal health and reduced risk for disease; flax seed is a source of omega 3 fatty acids.

Probiotics, or the good flora in the gut, can fortify the immune system. Increased toxic load will change the pH of the intestines, and the balance of beneficial flora. Stress can alter the balance of good bacteria in the gut, just as repeated antibiotic use will destroy the great immune-protecting potential of the probiotics (such as **lactobacillus strains**).

Suggested Dosage: Chew 1 tablet 3 times daily or as directed.

Size: 120

Vegetarian: No

Contraindications: None known.