



GENESTRA
BRANDS®

Liquid B Complex

Vitamin Supplement

Broad-spectrum B-vitamin complex

- Helps to maintain cognitive function, normal immune function and energy production
- Aids in the maintenance of healthy hair, nails and skin
- Convenient liquid format
- Great-tasting, natural tangerine-cherry flavour
- **Improved**
 - Now available in a 450 ml bottle

Liquid B Complex is a delicious combination of seven B vitamins, plus choline and inositol. It provides the adult Recommended Dietary Allowance (RDA) for thiamine, riboflavin, niacinamide, vitamin B₆, vitamin B₁₂, biotin and pantothenic acid.

B vitamins play an important role in energy metabolism as cofactors for numerous biochemical reactions in the body.¹ Vitamins B₆, B₁₂ and riboflavin are particularly critical in the metabolism of the amino acid metabolite homocysteine.¹

Vitamin B₁₂ has an additional role helping in the normal function of the immune system and is involved in red blood cell formation alongside vitamin B₆. In addition, biotin helps maintain cognitive functions as well as healthy hair, nails, mucous membranes and skin. Liquid B Complex also provides choline, a lipotrope that helps support liver function, plus inositol, an important second messenger and component of the phospholipid membrane.¹



EACH TEASPOON (5 ml) CONTAINS:

Thiamine (thiamine hydrochloride)	50 mg
Riboflavin	50 mg
Niacinamide75 mg
Vitamin B ₆ (pyridoxine hydrochloride)	50 mg
Vitamin B ₁₂ (hydroxocobalamin acetate, methylcobalamin)	75 mcg
Biotin	200 mcg
Pantothenic Acid (<i>d</i> -panthenol)75 mg
Choline (choline chloride)	50 mg
Inositol	50 mg

Non-Medicinal Ingredients: Purified water, concentrated apple juice, glycerin, natural flavours, citric acid, rebaudioside A (stevia leaf extract), xanthan gum, potassium sorbate

Recommended Adult Dose: Take one teaspoon two times daily with meals or as recommended by your healthcare practitioner. Shake well before each use.

Product Size: 450 ml Liquid

Product Code: 02131A

NPN 80081066



REFERENCES

1. Combs, GF. (2012). The Vitamins (4th ed.). USA: Elsevier.

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Liquid B Complex

Vitamin Supplement

Scientific Rationale:

Thiamine (vitamin B₁) is involved in nutrient metabolism and energy production through its coenzyme form, thiamine pyrophosphate (TPP), also known as thiamine diphosphate.¹ Within the mitochondria, TPP is an important coenzyme for the production of acetyl-CoA, succinyl-CoA and branched-chain amino acid metabolites, which play key roles in the Krebs cycle (a metabolic pathway that helps produce energy from food).^{1,2} TPP is also necessary for the hexose monophosphate shunt (also known as the pentose phosphate pathway).¹ This pathway helps generate pentoses and NADPH, a niacin-containing enzyme involved in various biosynthetic reactions.¹

Riboflavin (vitamin B₂) is an important component of flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD).² These coenzymes are responsible for electron transfer in many oxidation-reduction (red-ox) reactions.² Riboflavin-dependent enzymes are particularly essential for nutrient metabolism and can help activate pyridoxine and folate to their respective coenzyme forms.¹ Riboflavin also helps to maintain normal red blood cells by protecting them against oxidative stress.¹ In its coenzyme form FAD, riboflavin is required for the function of glutathione reductase, which supports intracellular levels of reduced glutathione, an important intracellular antioxidant.¹ Furthermore, riboflavin can form complexes with divalent cations, such as Fe²⁺.¹ As such, it may influence iron bioavailability and nutrient metabolism.¹

Niacin is necessary for the synthesis of the pyridine nucleotides NAD(H) and NADP(H), the primary electron carriers in cells.¹ These enzyme co-substrates participate in nearly all aspects of metabolism, including more than 200 reactions involving intracellular respiration and the oxidation of fuel molecules.² NAD, the oxidized form, accepts hydrogen ions to form NADH, which can donate hydrogen ions to the mitochondrial respiratory chain for ATP production.¹ NAD can be phosphorylated to NADP and reduced to NADPH, important compounds in the biosynthesis of steroids and fatty acids.¹ NADPH is also involved in the oxidation of glucose 6-phosphate in the hexose monophosphate shunt.¹

The metabolically active form of **vitamin B₆** is pyridoxal 5'-phosphate (PLP).¹ PLP is a coenzyme of more than 140 enzymes primarily involved in the synthesis and breakdown of amino acids.^{1,2} It has an important role in gluconeogenesis, the production of glucose from non-carbohydrate precursors, including amino acids.¹ As a coenzyme for glycogen phosphorylase, PLP is also required for the release of glucose from glycogen.¹ Although most of the body's vitamin B₆ is present in the muscle (70-80%), red blood cells contain high levels of the vitamin.¹ PLP supports

red blood cell formation through the synthesis of heme, an iron-containing part of hemoglobin.¹ In addition, vitamin B₆ is a cofactor for two enzymes in the tryptophan-kynurenine pathway, which converts tryptophan into the niacin coenzyme NAD.¹

Vitamin B₁₂ plays an important role in metabolism through its coenzyme form, methylcobalamin.¹ Methylcobalamin is required for methionine synthase, an enzyme that converts homocysteine to methionine.^{1,2} In turn, methionine is needed for the production of S-adenosylmethionine (SAM), a donor of methyl groups for more than 100 metabolic reactions, including creatine, phospholipid and acetylcholine synthesis.¹ In addition, vitamin B₁₂ helps in normal immune system function and red blood cell formation.^{1,2} As this vitamin is synthesized by bacteria and rarely present in plant-based foods, individuals consuming strict vegetarian or vegan diets may benefit from vitamin B₁₂ supplementation.¹

Biotin is involved in nutrient metabolism as a component of five biotin-dependent carboxylases.^{1,2} These carboxylases play important roles in gluconeogenesis, as well as fatty acid synthesis, elongation and oxidation.¹ Biotin also helps to maintain cognitive function and healthy hair, nails, mucous membranes, and skin. As a result, low levels of biotin can result in hair loss and dry, itchy or red skin.¹

Pantothenic acid (vitamin B₅) has a key role in nutrient metabolism as a component of coenzyme-A (CoA) and acyl-carrier protein (ACP).¹ CoA is a cofactor for 4% of known enzymes.¹ It is involved in the transfer of acyl groups in reactions primarily associated with energy metabolism.¹ CoA also has an important role in the production of fatty acids, membrane phospholipids, cholesterol, amino acids, vitamins A and D, and the neurotransmitter acetylcholine.^{1,2} Similarly, ACP is required for the function of fatty acid synthase, an enzyme complex responsible for the production of fatty acids.¹

Choline is found in all tissues as an important structural component of the phospholipid membrane.² Choline helps support liver function by promoting the export of very low density lipoproteins (VLDL) from the liver.¹ Furthermore, choline is required for the production of the neurotransmitter acetylcholine and has a role in methyl metabolism, including the transfer of methyl groups for homocysteine metabolism.¹

Inositol plays a key role in membrane structure and function in the form of phosphatidylinositol.¹ It also serves as a second messenger in the form of inositol 1,4,5-triphosphate (IP3), which helps release calcium ions from intracellular storage.¹

REFERENCES

1. Combs, GF. (2012). *The Vitamins* (4th ed.). USA: Elsevier.
2. Otten, JJ, Pitzel Hellwig, J, Meyers, LD. (2006). *Dietary Reference Intakes: The Essential Guide to Nutrient Requirements*. USA: National Academies Press.

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