

Vitamin

L I Q U I D

B₁₂



Contributing to the optimum energy and mental state



VITAMINS



ENERGY
METABOLISM



NERVE
FUNCTION

The nutritional role of vitamins goes beyond **the prevention of deficiency diseases** as well as the contribution to the prevention of the development of chronic diseases

Vitamins are organic micronutrients, without energy value, necessary for the human body in very small quantities and that must be **contributed through the diet, in a balanced way, to facilitate the appropriate physiological functioning.** Vitamins act as catalysts in all organic processes (directly or indirectly), starting from **metabolic pathways, hormonal production, neurotransmitters, cells and tissues... etc.**

Vitamins can be classified according to their solubility to: **water-soluble** ones, which are in total 9 vitamins (8 of them are B complex vitamins, and vitamin C), and **fat-soluble** ones, which are in total 4 vitamins (A, D, E and K).

The **daily and constant intake of water-soluble vitamins**, due to their mechanism of urinary excretion, **is necessary. These vitamins regulate or participate in a large number of metabolic reactions.** The **vitamin B complex is classified into this category**, and these vitamins are essential components of enzymes, which are responsible for catalysing a wide range of biochemical reactions, having to act at the level of the:



1 energy metabolism

2 nervous system

3 skin, hair and mucous membrane

4 muscle

Vitamin B12 is a water-soluble vitamin essential for many biochemical reactions of the human body. The vitamin is synthesised by microorganisms and **enters the human food chain through the incorporation of food from animal origin.** The prevalence and incidence of **vitamin B12 deficiency** is associated with the most frequent causes of pernicious anaemia, which its prevalence is in the range of 50 to 4000 cases per 100,000. **In general, all ages can be affected, but from 10 to 15% of elderly adults suffer from insufficient levels of vitamin B12.**

Among the main causes of vitamin B12 deficiency, we found that the main cause is pernicious anaemia (which is, at the same time, caused by vitamin B12 deficiency), mainly in infants, children, vegetarians, the case of using antacid drugs, malabsorption and inter alia.



Vitamin L I Q U I D B₁₂

facilitates the
**optimisation of
the metabolic
processes,
improving the
nerve function, the
blood profile and
the general states
at all ages**

03

MAIN BENEFITS

CONTRIBUTES TO THE
NORMALISATION OF THE
METABOLIC ENERGY
STATE AND THE VITAL
ORGAN FUNCTIONS

ITS REGULATORY ACTION
OF THE METABOLISM OF
HOMOCYSTEINE
FACILITATES THE
REDUCTION OF THE
CARDIOVASCULAR RISKS
AND IMPROVES THE BONE
HEALTH ^{5,8,10,13,14,15,18}

CONVENIENT DOSE OF
ONE TIME PER DAY

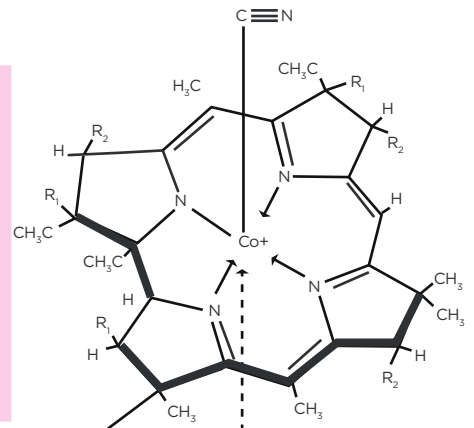
EASY DOSAGE:
PRESENTATION IN THE
FORM OF A BOTTLE WITH
DROPPER

SUITABLE FOR ALL AGES

Vitamin B12 is a food supplement developed for the **optimisation of metabolic processes, improving the nerve function, the blood profile and the general states at all ages**

Ingredient^{5,8,10,11}

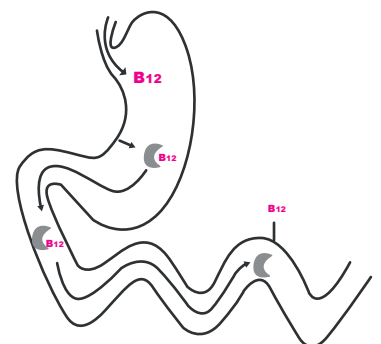
Biochemically spoken, vitamin B12 is the most complex of the vitamins. The term **cobalamin** refers to a group or a family of compounds with a specific structure. **The B12** is one of these cobalamins that results from the asymmetric binding of four pyrrole rings, forming a macrocyclic group (the core of corrin), around the cobalt molecule. The corrin ring is similar to the porphyrin ring, which could also be found in the **haem group**, in the chlorophyll and the cytochromes.



The **absorption of vitamin B12 in the human body is complicated**. It takes place in the stomach, where there is a high concentration of hydrochloric acid, where a complex compound is formed to protect the vitamin (intrinsic factor) from chemical denaturation and accordingly, allows for its active absorption. Once the vitamin enters the duodenum, the intrinsic factor of vitamin B12 goes to the lower end, where it is absorbed by phagocytosis of specific intestinal receptors. **The total amount of vitamin B12 stored in the human body is approximately 2 to 5 mg in adults**. Around 50% of this amount is stored in the liver.

Vitamin B12 works as a coenzyme in various biochemical processes, where the metabolism of homocysteine is one of the most important processes, since the optimal performance of this process leads to the optimisation of neurological and cardiovascular functions. It also contributes to the decomposition of the fatty acid chains, the synthesis of DNA and the production of red blood cells. Therefore, it helps in the energy utilisation, amino acid metabolism, red blood cells maintenance and tissue regeneration.

THE INTRINSIC FACTOR ALLOWS FOR THE ABSORPTION OF VITAMIN B12



Estimated requirements of Vitamin B12 according to age groups

Age range	NRV (µg/day)	Drops to be taken
0-6 months	0.4	2.24
7-12 months	0.5	2.80
1-3 years	0.9	5.04
4-6 years	1.2	6.72
7-9 years	1.8	10.08
10-65 years	2.4	13.44
>65 years	2.4	13.44
Pregnancy	2.6	14.56
Breastfeeding	2.8	15.58

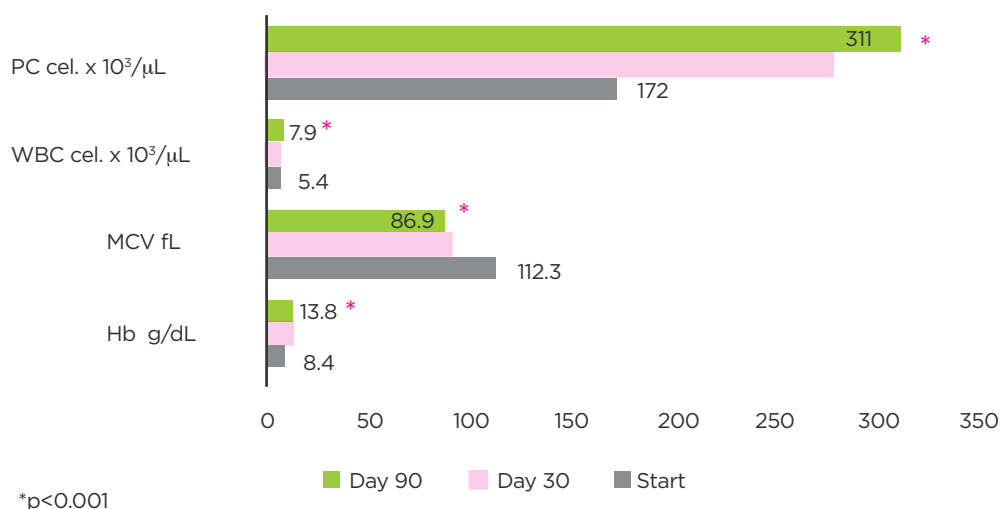
The **daily requirement of Vitamin B12 is approximately of 2.4 µg**. The next table describes the dosage recommended by FAO-WHO (Food and Agriculture Organization of the United Nations)

NRV: Recommended Nutrient Intake
0.5 ml = 14 drops

Vitamin B12 has shown:

A normalisation of the blood parameters in individuals with anaemia ^{19,3,5,10,11,17}

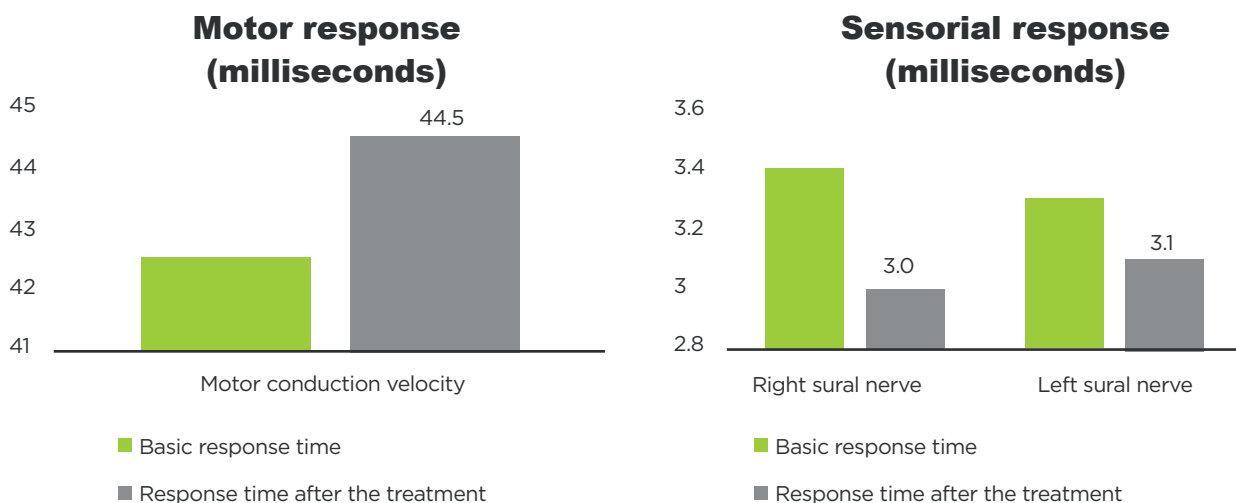
Results of the assessed haematological parameters



Hb = haemoglobin; MCV= mean corpuscular volume; WBC= white blood cell count; PC= platelet count

Adapted from Zahit Bolaman. *Clinical Therapeutics*; Vol. 25, No. 12, 2003

A significant improvement in the motor conduction and the nerve sensibility, contributing to an improved mental state ^{1,6,9}





**SUITABLE FOR
VEGANS**

Recommended Dose:
0.5 ml per day, preferably in the morning
Keep in a dry, cool place and in the absence of light.

VITAMIN B12 / 30 ml		
INGREDIENTS	PER 100 ml	% NRV
Vitamin B12 Source: Cyanocobalamin Origin: Fermentation	500 µg	•
PER DOSE	0.5 ml	
Vitamin B12	2.5 µg	100

% NRV (Nutrient reference value)

Proprietary Information for specialists. The distribution of this document, in whole or in part, is strictly prohibited.

- Alex Brito et al. Vitamin B-12 treatment of asymptomatic, deficient, elderly Chileans improves conductivity in myelinated peripheral nerves, but high serum folate impairs vitamin B-12 status response assessed by the combined indicator of vitamin B-12 status. *Am J Clin Nutr* 2016;103:250-7.
- Anne-Kathrin Siebert et al. Vitamin B-12-fortified toothpaste improves vitamin status in vegans: a 12-wk randomized placebo-controlled study. *Am J Clin Nutr* 2017;105:618-25.
- Bernard Favrat et al. Oral vitamin B12 for patients suspected of subtle cobalamin deficiency: a multicentre pragmatic randomised controlled trial. *BMC Family Practice* 2011, 12:2.
- David O. Kennedy. B Vitamins and the Brain: Mechanisms, Dose and Efficacy—A Review. *Nutrients* 2016, 8, 68.
- Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline, Chapter 9. A Report of the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes and its Panel on Folate, Other B Vitamins, and Choline and Subcommittee on Upper Reference Levels of Nutrients, Food and Nutrition Board, Institute of Medicine. National Academies Press, ISBN: 0-309-59725-0 (1998).
- Eric C. Seal et al. A Randomized, Double-Blind, Placebo-Controlled Study of Oral Vitamin B12 Supplementation in Older Patients with Sub-Normal or Borderline Serum Vitamin B12 Concentrations. *JAGS*; 50: 146-151, 2002
- Hubertus Himmerich et al. Vitamin B12 and Hepatic Enzyme Serum Levels Correlate in Male Alcohol-Dependent Patients. *Alcohol & Alcoholism*; Volume 36; No. 1, pp. 26-28, 2001.
- Human Vitamin and Mineral Requirements. Report of a joint FAO/WHO expert consultation, Bangkok, Thailand. Chapter 5: Vitamin B12. 2001
- J.M. Bourre. Effects of Nutrients (in Food) on The Structure and Function of The Nervous System: Update on Dietary Requirements for Brain. Part 1: Micronutrients. *The Journal of Nutrition, Health & Aging*. Volume 10, Number 5, 2006.
- Janos Zempleni et al. Handbook of Vitamins-Fourth Edition. Chapter 13: Vitamin B12. CRC Press, Taylor and Francis Group. International Standard Book Number-10: 0-8493-4022-5, 2007.

- Kathleen Woolf et al. Nutrition Assessment of B-Vitamins in Highly Active and Sedentary Women. *Nutrients* 2017, 9, 329.
- M. Cristina Castelli et al. Comparing the Efficacy and Tolerability of a New Daily Oral Vitamin B12 Formulation and Intermittent Intramuscular Vitamin B12 in Normalizing Low Cobalamin Levels: A Randomized, Open-Label, Parallel-Group Study. *Clinical Therapeutics/Volume 33, Number 3*, 2011.
- Maïke Wolters et al. Effect of multivitamin supplementation on the homocysteine and methylmalonic acid blood concentrations in women over the age of 60 years. *Eur J Nutr* (2005) 44 ; 183-192.
- Ramazan Kurt et al. Folic Acid and Vitamin B12 Supplementation Improves Coronary Flow Reserve in Elderly Subjects with Vitamin B12 Deficiency. *Archives of Medical Research* 41 (2010) 369-372.
- Renate M Winkels et al. Bread cofortified with folic acid and vitamin B-12 improves the folate and vitamin B-12 status of healthy older people: a randomized controlled trial. *Am J Clin Nutr* 2008;88:348-55.
- Shantanu Chowdhury and Ruma Banerjee. Thermodynamic and Kinetic Characterization of Co-C Bond Homolysis Catalyzed by Coenzyme B12-Dependent Methylmalonyl-CoA Mutase. *Biochemistry* 2000, 39, 7998-8006.
- Silvia Maggini et al. Selected vitamins and trace elements support immune function by strengthening epithelial barriers and cellular and humoral immune responses. *British Journal of Nutrition* (2007), 98, Suppl. 1, S29-S35.
- Valentina Fratoni and Maria Luisa Brandi. B Vitamins, Homocysteine and Bone Health. *Nutrients* 2015, 7, 2176-2192.
- Zahit Bolaman et al. Oral Versus Intramuscular Cobalamin Treatment in Megaloblastic Anemia: A Single-Center, Prospective, Randomized, Open-Label Study. *Clinical Therapeutics*; Vol. 25, No. 12, 2003.