

# Vitamin B12 Fact Sheet

Vitamin B12 is essential for keeping the body's nerve cells and blood cells healthy. It plays a key role in forming the protective myelin sheath around nerves, supporting brain function and communication throughout the body. B12 is also needed to make red blood cells, helping prevent megaloblastic anaemia, which can cause fatigue and weakness. Along with folate, it helps produce DNA - the genetic material in all our cells. It also supports the immune system and may assist in serotonin production, which can influence mood. Needs for B12 and folate increase during pregnancy and breastfeeding to support both mother and baby.

Absorbing vitamin B12 is a two-step process. In the stomach, acid releases B12 from food, allowing it to bind to a protein called intrinsic factor. This combination travels to the end of the small intestine, where it is absorbed. If intrinsic factor is not produced, as in pernicious anaemia, B12 cannot be absorbed properly.

Because B12 is stored in the liver, deficiency may take years to appear. Low levels at coeliac diagnosis may suggest long-term disease. Some medications, including those for reflux or type 2 diabetes, can also affect absorption. Check your medications with your doctor.

## Recommended intakes<sup>3</sup>

| Age         | Male        | Female      | Pregnancy   | Lactation   |
|-------------|-------------|-------------|-------------|-------------|
| 0-6 months  | 0.4 ug /day | 0.4 ug /day |             |             |
| 7-12 months | 0.5 ug /day | 0.5 ug /day |             |             |
| 1-3 years   | 0.9 ug /day | 0.9 ug /day |             |             |
| 4-8 years   | 1.2 ug /day | 1.2 ug /day |             |             |
| 9-13 years  | 1.8 ug /day | 1.8 ug /day |             |             |
| 14-18 years | 2.4 ug /day | 2.4 ug /day | 2.6 ug /day | 2.8 ug /day |
| 19+ years   | 2.4 ug /day | 2.4 ug /day | 2.6 ug /day | 2.8 ug /day |

## Usual Sources

**We obtain our vitamin B12 from animal foods, but not plant foods.** It can only be made by certain bacteria found in animals. Good sources include organ meats, red meat, poultry, seafood, dairy products and eggs. In

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a usual adult diet about 25% will come from red meat<sup>1</sup> and 30% from dairy foods<sup>2</sup>. Children<sup>2</sup> may take in 50% of their B12 requirements from dairy foods. If animal foods are regularly eaten there is not usually any deficiencies with B12 supply to the body.

**Vegetarians:** Eggs and dairy products will supply B12. B12 in eggs is poorly absorbed<sup>4</sup>.

**Vegans:** Nutritional yeasts, tempeh, miso, some mushrooms and edible algae can supply B12. Select breakfast cereals or plant foods and plant milks are being fortified with B12

## Selected Food Sources<sup>3</sup>

| Food Per Average Serving Size | ug/serve) | Food Per Average Serving Size   | ug/serve) |
|-------------------------------|-----------|---------------------------------|-----------|
| Oysters x 6 (~80g)            | 12        | Eggs, 120g (mostly in the yolk) | 1.4       |
| Sardines, canned, 100g        | 8.3       | Cows milk & lactose free, 250ml | 1.2       |
| Salmon cooked, 100g           | 3.2       | Canned tuna, 100g               | 1.1       |
| Crab cooked, 100g             | 2.5       | Yoghurt, natural, 200g          | 1         |
| Lamb cooked, 100g             | 2.5       | Cheddar cheese, 40g             | 0.7       |
| Beef cooked, 100g             | 2.3       | Turkey cooked, 80g              | 0.6       |
| White fish cooked, 100g       | 1.85      | Chicken cooked, 80g             | 0.2-0.6   |
| Duck liver (pate), 1Tbsp      | 1.62      | Haloumi, 40g                    | 0.3       |
| Prawns cooked, 100g           | 1.4       | Ricotta cheese, 120g            | 0.2       |

## Vegan Sources

| Food                                     | Serve quantity | ug/serve |
|------------------------------------------|----------------|----------|
| Nutritional yeast/nooch                  | 1 tsp          | 7.8      |
| Fortified vege meats (varies with brand) | 100g           | ~3       |
| Soy beverage B12 fortified (varies)      | 250ml          | ~2.2     |

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|                                                    |                        |                      |
|----------------------------------------------------|------------------------|----------------------|
| *Dried purple & green laver algae / nori sheets    | 5g = 4x Nori sheets    | 1.5-2.6 <sup>5</sup> |
| *dried Shiitake mushroom varied results... average | 100g                   | 1.09-2.65            |
| *Mushrooms: golden chanterelle, black trumpet      | 100g <b>dry</b> weight | 1.09-2.65            |
| Fermented soy luncheon                             | 60g                    | 0.6                  |
| *Mushrooms: porcini, oyster, black morel, parasol  | 100g <b>dry</b> weight | 0.09                 |

B12 fortification varies with the products. Nutritional yeast, or nooch, supplies the umami flavour to vegan foods such as cheese. B12 content varies, so look for supplemented versions.

\*This research by Watanabe et al<sup>4</sup> suggests that eating about 50 grams of dried shiitake mushrooms, will on average provide the suggested adult B12 requirement of 2.4ug per day. However, ingesting this quantity daily is not sustainable. They don't represent fresh mushrooms. Real quantities ingested by vegans can supply some B12, but not the daily requirement.

\* There has traditionally been a cautious approach to relying on seaweeds as a source of vitamin B12, as it is considered to be inactive in most algae's. However, a 2024 study<sup>6</sup> found that roasted nori (purple laver) sheets, distinct from other types of algae, contain bioavailable vitamin B12, and that consuming 5 g daily may improve vitamin B12 status in vegetarians.

As part of your annual coeliac disease health review, it is worth having your vitamin B12 status checked and monitoring the results in the context of your dietary intake. This can help determine whether supplementation is required, as is generally recommended for people following vegetarian or vegan diets. Always discuss supplementation with your healthcare team.

## Supplements

There are 2 forms of B12 generally used in supplements.

**Methylcobalamin** is the type found in animal-based foods. It is thought to be the superior form to find in a supplement because B12 in this “free-form” can immediately bind with intrinsic factor in the stomach. Methylcobalamin is the specific form of B12 needed for the health of the nervous system.

**Cyanocobalamin**, most commonly found in supplements and fortified foods, is the most stable, chemically synthesized form of B12. The body will need to convert the cyano form into the methyl form, or the 5-deoxyadenosylcobalamin form, in order to bind to intrinsic factor to be absorbed. The ‘cyano’ form is cheaper to produce and contains a cyanide molecule that is too small to be harmful, but the body will need to eliminate this compound.

The amount of B12 absorbed is determined by the amount of intrinsic factor. Hydrochloric acid in the stomach is required to release intrinsic factor, which binds to B12. B12 dissolving tablets or sprays applied under the tongue, enhance absorption of B12 directly into the blood stream. A number of studies conclude there is no difference in effectiveness of swallowed tablets versus sublingual administrations for most

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people. However, those who may benefit the most from sublingual vitamin B12 supplements are those who have lower levels of hydrochloric acid, perhaps from using reflux medications, and those with low levels of intrinsic factor. As we age we absorb less B12 and heavy alcohol consumption can deplete B12. Being deficient in this vitamin for long periods of time may be irreversible.

B12 supplements tend to supply around 1000 ug a day without toxic effect, even though much smaller amounts are recommended daily. It is thought that you might only absorb a little more than 10ug from a 500- 1000ug dose of B12. The body uses what it needs, stores a little in the liver and the rest leaves the body through the urine.

## References

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2. Baghurst KI, Record SJ, Leppard P. Red meat consumption in Australia: intakes, nutrient composition and changes over time. *Aust J Nutr Diet* 2000;57(4) Suppl:S1-S36.
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4. Nutrient Reference values for Australia and New Zealand. [Vitamin B12 | Eat For Health](#)
5. [Watanabe F et al. 2014. Vitamin B<sub>12</sub>-containing plant food sources for vegetarians. \*Nutrients\*. 6\(5\). 1861–1873. <https://doi.org/10.3390/nu6051861>](#)
6. Huang, QN., Watanabe, F. et al. Effect of roasted purple laver (nori) on vitamin B12 nutritional status of vegetarians: a dose-response trial. *Eur J Nutr* 63, 3269–3279 (2024). <https://doi.org/10.1007/s00394-024-03505-9>

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