



Seagreens®

Iodine sufficiency from
nutritious food seaweed

For professional use



Facts worth knowing

Widespread iodine insufficiency has been identified, and is of concern, worldwide (1). For years, more than half the European population has had an insufficient daily intake (2). Yet European native wild harvested seaweeds are rich food sources of well documented, bioavailable iodine (3), and iodine is one of the least available minerals in our agricultural soils (4).

For 25 years Seagreens® has been providing independently certified nutrition supplements for iodine deficiency, and pure seaweed ingredients to manufacturing customers in many countries.

Leading UK brands like Cytoplan, G&G, Pukka, Napiers, and Viridian Nutrition; and Tisso Naturprodukte in Germany, Natural Point in Italy, and Bioteekki in Finland also produce good quality supplements containing Seagreens® BDA certified nutritious food seaweed.

Seagreens® range of products and ingredients provide a complete natural source of dietary micronutrients and minerals including iodine.

What does iodine do?

Iodine is critical in many bodily functions, particularly the production of thyroid hormones. Insufficiency is a common cause of hypothyroidism (underactive thyroid) (5). Iodine is converted by the thyroid into thyroxine (T4) and triiodothyronine (T3), which are essential to control metabolic processes such as breathing, heart rate, and menstrual cycles. They influence body weight and temperature, cholesterol levels, mammary gland function and the central and peripheral nervous systems (5). Symptoms of iodine deficiency include weight gain, muscle pain, lethargy, heart disease, cognitive impairment, and various cancers (6).

The size of the problem

In the UK, 66% of women and over 75% of 14-year-old school girls tested (7), 82% of pregnant women (8), and 52% of 25-year-old students (3), were found to have insufficient dietary iodine. 49% of babies were found to be mildly deficient (9).

Sufficient daily intake is especially important in women of child bearing age, in pregnancy, and in young children, since iodine is crucial for foetal and child brain development (10).

The link with iodine insufficiency was confirmed in women of child-bearing age in large-scale Scottish and Norwegian studies as recently as 2017 (11, 12).

Even a mild form of iodine deficiency during pregnancy has an irreversible impact on the child's educational outcomes during the first 9 years of life. Autism in children may be 4 times more likely if the mother has a weakened thyroid function during pregnancy (13).

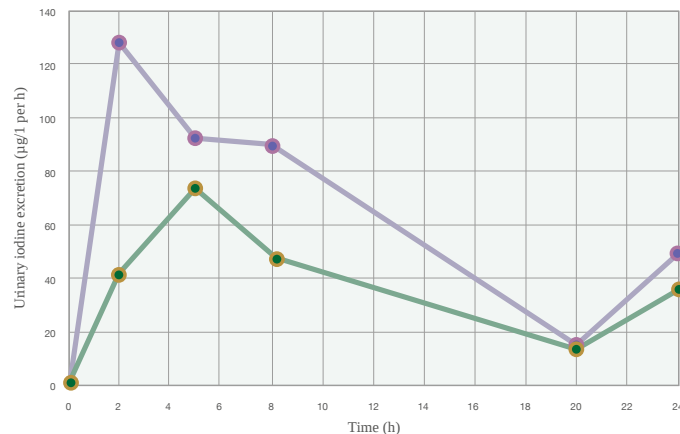
Food based iodine is recommended. The slowly absorbed iodine from Seagreens® is a safe and effective way for pregnant mothers and children to achieve iodine sufficiency.

Researching the solution

In 2013, independent research was conducted using Seagreens® wild Wrack seaweed *Ascophyllum nodosum* at Glasgow University. It restored iodine sufficiency in deficient female subjects given a daily intake of 2x 500mg vegetable capsules, and normalised TSH (thyroid stimulating hormone) with no adverse effect on thyroid function.

In addition, the Seagreens® seaweed was found to provide more prolonged and stable uptake than manufactured potassium iodide (see opposite), which for decades has been used to fortify industrial and domestic table salt. The research was published in 2014 in the *British Journal of Nutrition* (3). Nevertheless, governments continue to specify cheaper potassium iodide, most recently to fortify bread and other baked goods in Denmark (14). Formulated iodine supplements may also contain high levels of potassium iodide.

The researchers concluded that Seagreens® iodine is “modestly bioavailable at 33%”, and improved iodine intake by 60%. Prolonged daily use does not interfere with the drug thyroxine commonly prescribed for underactive thyroid (hypothyroid), and would not exceed the recommended maximum daily intake even if consumed by those with sufficient iodine (3).



Urinary iodine excretion over 24h after the ingestion of a dose of 712 µg of iodine from potassium iodide (●) or Seagreens® *Ascophyllum nodosum* (●).

Recent studies have shown Seagreens® seaweeds to be effective natural prebiotics, stimulating digestive fermentation by beneficial bacteria. Colonic fermentation may cause the prolonged release of the iodine, and reduce glycaemic response to carbohydrate load (15), with positive implications in obesity* and diabetes. Although unrelated to iodine or thyroid function, high levels of antioxidants in the seaweed, as potent as in green tea (but caffeine free), survived into the lower intestine where they are effective free radical scavengers (16).

**In an award-winning study at Sheffield Hallam University, overweight men who ate Seagreens® at breakfast, were less hungry during the rest of the day enabling them to lose weight, with no adverse effect on nutrient uptake (17).*

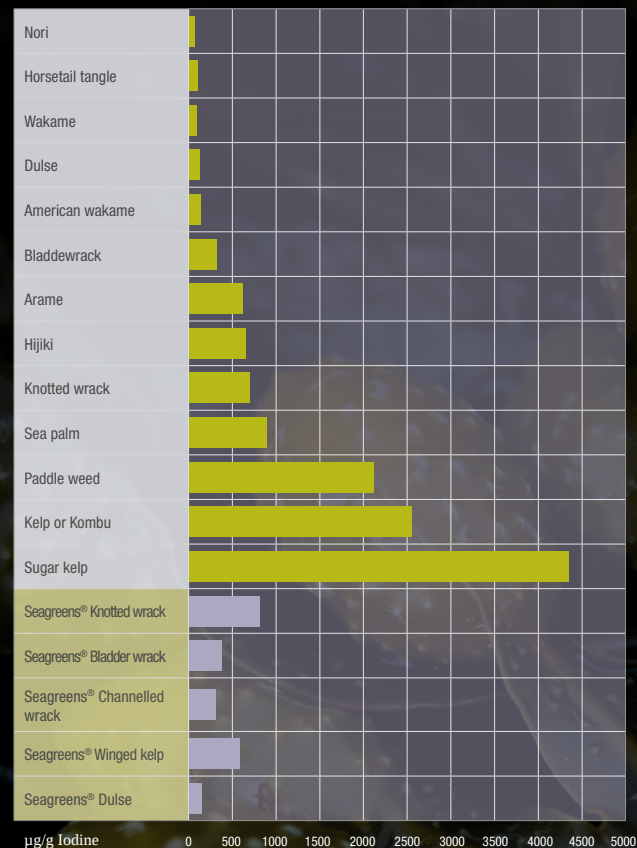
Understanding seaweed iodine

Iodine is a naturally occurring mineral element, drawn from the ocean into the plant, transformed into soluble iodine (I₂) and Iodide (I⁻), chelated by protein ions in the seaweed. Iodine levels in different seaweed species have predictable variances and averages which in Seagreens[®], are particularly well documented. For example, in Seagreens[®] *Ascophyllum* (Knotted Wrack) the average iodine level has changed over 10 years by only 150 points from 720 to 870µg/g. Seagreens[®] average iodine levels vary from 200µg/g in *Palmaria* (Dulse), to 262µg/g in *Pelvetia* (Channel Wrack), 425µg/g in *Fucus* (Bladder Wrack), and 589µg/g in *Alaria* (Winged Kelp, often wrongly called Wakame).

Seagreens[®] guarantees a maximum variance in iodine levels of 34%. An inclusion level of only 59mg Seagreens[®] *Ascophyllum*, or 106mg Seagreens[®] *Fucus* in a food or supplement, warrants the EU approved health claim that ‘iodine contributes to normal thyroid, skin, nervous system and cognitive function, energy-yielding metabolism, and normal growth in children’.

The *British Health Food Manufacturers' Association* (HFMA) advises that supplementation should not exceed 500µg iodine per day. The *European Food Safety Authority* (EFSA) allows an upper tolerable daily intake of 600µg day which permits the consumption of larger quantities of seaweed, among other iodine sources (seafood, meat and dairy products). In the USA this figure is 1100 µg per day.

Iodine variance in commercially available seaweeds (English names)



Teas J, Pino S, Critchley A, Braverman LE. Variability of iodine content in common commercially available edible seaweeds. *Thyroid*. 2004;14(10):836-41. Seagreens[®] data from Current data and the growth of seaweed ingredients, Issue 4, 2020.

Iodine is mainly stored in the thyroid gland, and in a variety of tissues including mammary and salivary glands, eyes, gastric mucosa, and the cervix. Iodine receptors reject excessive iodine, freely excreted in urine. Naturally occurring halogens such as chlorine and bromine, ubiquitous as additional industrial pollutants, may reduce the bioavailability of total dietary iodine, because they compete for iodine receptors.

A 2018 review in the international scientific journal *Food Chemistry* noted that “concerns over iodine toxicity from eating seaweed appear to be unfounded. However, seaweed must be sourced from near-pristine and clean environments, where there is no concern for biological and chemical contamination or other environmental pollutants” (18). All the recent data supports this view. “Despite high levels of iodine present in some seaweeds, ingestion of large amounts will not necessarily imply a risk for excessive intake of iodine. In the most recent research, only 49–82% of seaweed iodine appeared to have bioavailability (to systemic circulation) after gastrointestinal digestion, and it was suggested that seaweed iodine may have low bioavailability (<30%)” (19).

Seagreens® seaweed is produced to Nutritious Food Seaweed standard, complies with international food safety and organic regulations, and research shows is at least 33% bioavailable (3). It is suitable for Kosher, Halal, Vegan, and raw, free from and other special diets.

Which product?

Every Seagreens® product provides some level of iodine, and all the nutrient groups, vitamins and minerals, amino acids, protein, essential fatty acids, enzymes, antioxidants, polyphenols and soluble fibre. So it depends how much iodine is appropriate, and what balance of the other nutrients is required. All products are easy to use on a daily basis.

Iodine ranges from less than 150µg/g in Iodine Lite+ capsules, to approximately 870µg/g in the Culinary Ingredient, subject to natural variance. No Seagreens® product contains other than pure whole seaweed - nothing is extracted, nothing added. Where encapsulated, it is in ‘Trufilled’ vegetable capsules - filled to the stated volume, not an average, with no flowing or filling agents. Each product is profiled below, beginning with those whose primary purpose is *iodine supplementation*.



**Nutritious
Food Seaweed**

BDA CERTIFICATION

Iodine sufficiency



Iodine+ Capsules 60 for adults

One per day, two months per jar
Iodine typically 420µg per capsule



Iodine Lite+ 90 for children

One a day, three months per jar
Iodine typically 150µg per capsule

For sufficiency in iodine, *whenever there is a known deficiency*, a single capsule each morning. These products are called 'Iodine+' because they naturally contain vitamins such as B9 and B12, minerals such as magnesium, selenium and zinc, and other nutrients the body needs for the effective transport and metabolism of iodine.

Iodine Lite+ is best for children, giving them the required nutrients all the way through to adulthood. It may also suit adults who merely wish to 'top up' against iodine deficiency.

Seagreens 'feeds' the thyroid, unlike pharmaceutical drugs which replace the production of natural T4. Thyroxine may be prescribed in combination with Seagreens® if the thyroid still needs support.



Nutritional balance



Food Capsules 60 & 180

Two capsules per day, 1 month or
3 months per jar
Iodine typically 390µg per 2 capsules
2 Food Capsules = 1g Food Granules



Food Granules 90g

A quarter teaspoon (1g) per day,
3 months per jar
Iodine typically 390µg per gram

This unique blend of native wild wrack seaweeds (see jar label) has been widely used for over 20 years for comprehensive daily nutrition and at higher levels in nutritional therapy. Both products provide all of Seagreens® health benefits, the subject of research since 2008 - see opposite. For young children use half the amount.

Food Capsules are for a measured intake on a convenient daily basis. 2 capsules each morning or higher levels with nutrition advice. Safe for permanent use as a daily dietary foundation.

Food Granules are the microfine soluble content without capsules - better for tonics, teas, smoothies, and as a food sprinkle - useful for children and the elderly. At least 1 gram or 1/4 teaspoon daily. Use in hot water will greatly reduce iodine, but low or no heat is recommended.

Seagreens® wild wrack species provide nutrient dense, mineral rich, natural whole food ingredients, which in the daily diet, can deliver iodine sufficiency with no adverse effect on thyroid function (3), reduce the glycaemic response to carbohydrate load (16), assist in the digestion of fats (20), reduce hunger via lowered gastric emptying with a positive effect on nutrition (17) and potentially in diabetes (21), in digestion are effective prebiotics (15, 16, 22) and help protect the gut lining (23), and are high antioxidant free-radical scavengers (16). They are a comprehensive source of nutrition which may help to ameliorate numerous risk factors associated with diabetes, obesity, endothelial dysfunction, hypertension, cardiovascular disease (24) and human cognitive disorders including dementia, depression and bipolar diseases (25).

References see page 22.





Everyday nutritious food

Culinary Ingredient 90g

A pinch or more per day, up to 3 months per jar
Iodine typically 435µg per pinch

This classic food ingredient, which looks like olive green ground pepper, is pure Seagreens® wild, dry milled *Ascophyllum* seaweed. Its mineral and mild *umami* flavours add complexity to virtually all foods, sauces, soups, even yoghurt. Bake into bread, add to ready meals, mix in muesli, rub on fish, sprinkle on potatoes. *A large pinch a day fills all the nutrient gaps in everyday foods including iodine.*

“Breakfasting on a slice of bread baked with (this) brown seaweed could help burn more calories than half an hour on a treadmill” said *The Daily Telegraph* after award-winning obesity research found Seagreens® reduced hunger with no adverse effect on nutrient uptake (17).



Half the salt, twice the flavour

The Mineral Salt 90g

Use as for salt, up to 3 months per jar

Iodine typically 435µg/g

Halve your salt intake with this healthier option containing 50% Seagreens® wild wrack seaweed, 50% British natural sea salt. You get the salty flavour, complex mineral and mild *umami* flavours, and improve nutrient balance.

In research, 50% wrack seaweed was an antidote in rats fed salt at levels causing heart failure (26).

International studies show a significant correspondence between reduced daily salt intake and reduced risk of cardiovascular disease, and of stomach cancer in men and women (27).

The risk of stomach cancer in men on a low salt intake of 4-6g daily was half that of men consuming 12-15g per day; in women it was 35% lower (28).

The Mineral Salt can reduce overall salt consumption and replace fortified iodised salt. Better than sodium chloride and potassium iodide, it is a healthier way to achieve iodine sufficiency.



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