

# Scientific Review Paper: Seaweed for Cognitive Health

Humans have consumed seaweed for millennia as a readily available and nutrient dense source of essential nutrition. Archaeological evidence supports that it was this consumption that was key in the evolution of the larger and more intelligent modern human brain from early *Homo sapiens* 2-2.5million years ago<sup>i</sup>.

Flashforward to the present, and individuals are re-evaluating their attitudes towards health in light of the Coronavirus pandemic. Consumers are beginning to recognize the direct link that areas such as cognitive health have on their overall wellness – with 66% of global consumers stating their interest in cognitive health products in 2021<sup>ii</sup>.

But what is it about seaweed that makes it such a valuable food for our cognitive health?

## Seaweed as a Source of Iodine for Cognitive Health

Seaweed is a good natural source of iodine – an essential micronutrient needed in human diets. As iodine is an integral component of thyroid hormones, it mediates the effects on brain development, as well as other functions in the body including the metabolism, nervous system, development in children and healthy skin<sup>iii</sup>.

Many brain structures and systems appear to be affected with iodine deficiency, including areas such as the hippocampus, microstructures such as myelin, and neurotransmitters. To highlight just how integral iodine is to cognitive health - iodine deficiency is the most prevalent and preventable cause of mental impairment in the world<sup>iv</sup>. Consequently, the essential nature of seaweed in our evolutionary history, remains just as important today.

Iodine deficiency is a global public health concern, even in developing countries. The UK currently ranks seventh among the ten most iodine-deficient nations in the world, and one of only two high income countries on the list<sup>v</sup>. In 2021, the Iodine Global Network reported, from an EU funded study, that Europe is an iodine deficient continent<sup>vi</sup>. Furthermore, the World Health Organisation (WHO) have estimated that 1.9 billion people have an insufficient iodine intake across 47 countries – this corresponds to 31% of the world's population<sup>vii</sup>. Those following a plant-based diet have been identified as particularly at risk from experiencing iodine deficiency<sup>viii</sup>.

## The Effects of Iodine on Cognitive Function

It has been shown that an inadequate supply of iodine at the start of life can result in intellectual ability being reduced by 10-15 Intelligence Quotient (IQ) points<sup>ix</sup>. Iodine deficiency is arguably most critical during the early stages of development, due to the foetal brain being dependent on adequate iodine supply<sup>x</sup>. Supporting this, research has found a positive association between the iodine status of women both before<sup>xi</sup> and during pregnancy<sup>xii</sup> and the subsequent cognitive scores of their children.

Since the brain is a major target organ for thyroid hormones, iodine deficiency disorders such as hypothyroidism can have a significant impact on cognitive function in adults. Hypothyroidism can affect various aspects of cognition - studies have reported the negative effects of hypothyroidism on general intelligence, attention, concentration and memory – with memory consistently being the most affected domain<sup>xiii</sup>.

With regards to seaweed in particular, research has been carried out to examine the effects of consumption of the species of seaweed used in PureSea® on the cognitive function of adults<sup>xiv</sup>. This study found that seaweed consumption resulted in significant improvements to accuracy on digit vigilance and choice reaction times.

### Natural vs Synthetic Iodine

As the major sources of iodine are dairy and fish, the already serious issue of iodine deficiency may be exacerbated by the rise in plant-based diets. Seaweed is the only good natural, plant-based source of this essential nutrient. It has been demonstrated in independent clinical trials that PureSea® seaweed releases iodine in a more sustained way, with longer retention in the body compared to artificial sources (potassium iodide) often used in other supplements (Figure 1)<sup>xv</sup>.

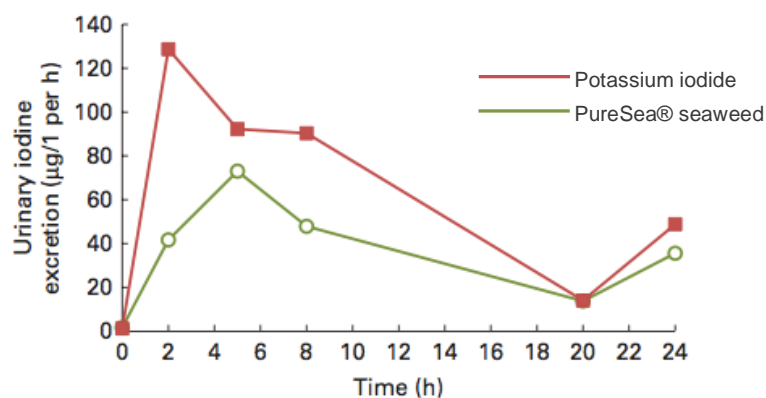


Figure 1: Urinary iodine excretion comparison between sources of iodine: potassium iodide and Hebridean Ascophyllum Seaweed

## Sourcing Seaweed for Cognitive Health

Seaweed provides the only good natural, plant-based source of iodine to benefit cognitive function and wider aspects of health and nutrition.

Seaweed & Co., the company behind the PureSea® seaweed ingredients, is leading research projects with Glasgow University Medical School investigating PureSea® as a natural iodine source for aspects of thyroid health and nutrition.

To achieve a European Food Standards Agency (EFSA) claim on cognitive health, only 100mg of PureSea® is needed per serving as a good source of iodine.

PureSea® is sustainably harvested from the pristine waters of the Scottish Outer Hebrides, ensuring a safe and quality supply, with every batch measured for iodine. PureSea® ingredients are delivered in a range of powder formats that are easy-to-use in any nutrition, food or beverage application.

## About the Authors

Dr Craig Rose is a marine biologist, founder and managing director of Seaweed & Co. Craig has worked commercially and on research projects on the benefits of seaweed for around 15 years, and leads several research projects with university partners, is on industry advisory bodies and has presented at numerous conferences and to the media.

Sarah-Jane Hall is a Registered Associate Nutritionist, with a degree in Human Nutrition and a master's degree in Public Health Nutrition. Sarah-Jane is the in-house Nutritionist at Seaweed & Co. and has conducted research on various aspects of nutrient deficiency – specifically iodine deficiency.

Seaweed & Co. as a company advise on, supply and accredit seaweed, using proprietary technologies and techniques. Their Organic and Kosher certified PureSea® seaweeds are supplied into the food, health and nutrition markets. Their seaweeds are sustainably wild harvested, naturally rich in iodine, uniquely DNA Authenticated for world class analytical traceability, and extensively batch tested and accredited for safety and quality.

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## FOR ADDITIONAL INFORMATION ON PURESEA®



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### References:

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- <sup>ii</sup> FMCG Gurus (2021) <https://fmcggurus.com/blog/fmcg-gurus-the-growing-importance-of-cognitive-health/> (accessed December 2021).
- <sup>iii</sup> Commission Regulation (EU) No 432/2012 of 16 May 2012 establishing a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:136:0001:0040:EN:PDF>
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