Seaweed (Agar-agar) at Newport beach, California.

Seaweed

Nature's secret for a long and healthy life?

This summary of a very comprehensive article by **Jane Philpott** and **Montse Bradford** is reprinted to draw readers' attention to the truly awesome nutritional content of seaweeds – some 10–20 times that of land-grown plants – and their medical uses. The accompanying Table is part of a full analysis of the nutrient composition and use of different types of seaweed.

The health benefits of consuming seaweed were recognised over 3,000 years ago, particularly in Asia, where marine algae are still prized for their nutritional content. The vast majority of marine algae are edible, with only a few tropical species being poisonous. Some species, however, are specially selected for their appealing flavour, texture or culinary versatility; these include dulse (*Palmaria palmata*), nori (*Porphyra tenera*), sea lettuce (*Ulva lactuca*) kombu (*Laminaria japonica*), wakame (*Undaria pinnatifida*), arame (*Eisenia bicyclis*), hijiki (*Hizikia fusiforme*) and agar-agar (*Sphaerococcus euchema*).

Sea vegetables are low in fat, low in calories and rich in essential minerals, vitamins and protein. The mineral content of seaweeds is very significant and is likely to explain many of their beneficial effects on health. Seaweeds provide all of the 56 minerals and trace minerals required for the body's physiological functions. Indeed, they contain 10 to 20 times the minerals of land plants and an abundance of vitamins and other elements necessary for metabolism. The modern diet is severely depleted of minerals due to a general decline in soil and crop mineral content, and to refining and processing, which strips food of minerals and other vital nutrients. Thus, addition of seaweed into the diet is very important to ensure adequate intake of minerals, which are in a highly assimilable form because they are integrated into living plant tissue.

Sea vegetables are especially useful for vegetarians and those abstaining from dairy foods because of their high levels of calcium, iron and iodine. In addition to minerals, seaweeds contain vitamins A, B, C, and E, and *Porphyra* species are reported to contain vitamin D. Moreover, some seaweeds contain what appears to be vitamin B12, which is normally found only in animal products. Seaweeds contain 50 to 60 percent polysaccharides, notably cell wall, structural polysaccharides that are extracted by the hydrocolloid industry.

Despite this large quantity of carbohydrate, sea vegetables add few calories to the diet; this is because much of their starch consists of a substance called algin. Alginates are not easily digested by the body, acting like soft fibre, soothing and adding bulk to the digestive tract. Scientific studies have shown that alginates inhibit absorption of toxic metals and radioactive isotopes, such as strontium-90, in the digestive tract.

All sea vegetables contain significant amounts of protein, sometimes as much

as 48 perecent. Lipids represent only 1–5 percent of algal dry matter and show an interesting, polyunsaturated fatty acid composition, particularly regarding omega-3 and omega-6 acids, which are concentrated in the galactolipid fractions.

Medical uses

Sea vegetables have traditionally been used in Asia to treat cancer, heart disease and thyroid problems. Other medicinal uses are currently being investigated. Scientific research aimed at explaining the positive effects of seaweeds on health is in progress and some key findings related to breast cancer, heart disease, thyroid problems, immune function, inflammation and anti-bacterial and anti-viral activity are reviewed. Finally, practical information on how to prepare and cook nori, arame, dulse, kombu, wakame, hijiki and agar-agar is given, as well as some recipes. ✪

This summary is reprinted from a much longer article first appearing in *The Nutrition Practitioner* 2006, Winter, Vol 7, no 3, pp 29–43, from which it is reprinted with permission. To see or obtain the original article, go to: www.nutrprac.com or ring 0118 979 8686. For a similar analysis of seasalt, see: Salt: From white gold to white poison, *Caduceus*, 65 Winter 2004: 29–35.

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Table 1: Nutritional analysis of sea vegetables compared to other foods

g/100g	Fibre NSP	Water	Protein	Fat	Carbohydrate	Minerals*	Energy kcal	Energy kJ
Nori	4.7	5.1	35.6	0.6	46.3	1.03	349	1,483
Arame	1.1	11.5	12	0.2	68.1	6.36	313	1,328
Dulse	1.2	13.8	7.9	0.1	59.8	9.20	272	1,155
Kombu	3.0	18.2	7.3	0.3	61.6	7.27	274	1,165
Wakame	3.6	16.3	17.3	0.7	39.0	9.17	232	983
Hijiki	17	6.2	10	0.1	56.8	6.50	260	1,104
Agar-Agar	0	20.6	1.9	0.4	73.7	3.40	306	1,300
Spinach raw	2.1	89.7	2.8	0.8	1.6	0.91	25	103
Broccoli raw	2.6	88.2	4.4	0.9	1.8	0.54	33	138
Carrots Young raw	2.4	88.8	0.7	0.5	6.0	0.34	30	125
Whole milk	0	87.6	3.3	3.9	4.5	0.42	66	274
Oranges	1.7	86.1	1.1	0.1	8.5	0.23	37	158
Dried skimmed milk	0	3.0	36.1	0.6	52.9	4.50	348	1482
Beef average trimmed raw	0	71.9	22.5	4.3	0	0.64	129	542

* Sum of concentration of Ca, K, Na, Mg, P, Fe, I in g/100g

per 100g	Calcium mg	Iron mg	Iodine mg	Potassium mg	VitA Iu	Vit B1 mg	Vit B2 mg	Vit C mg
Nori	470	23	1	3,505	11,000	0.25	1.24	20
Arame	1,170	12	300	3,860	50	0.02	0.20	0
Dulse	296	150	150	8,060	188	0.63	0.50	30
Kombu	800	15	300	5,800	430	0.08	0.32	11
Wakame	1,300	13	25	6,800	140	0.11	0.14	15
Hijiki	1,400	29	40	14,700	150	0.01	0.2	0
Agar-Agar	400	5	0	-	0	0	0	0
Spinach Raw	170	2.1	0.002	500		0.07	0.09	26
Broccoli Raw	56	1.7	0.002	370		0.1	0.06	87
Carrots Young Raw	34	0.4	0.002	240	12036	0.04	0.02	4
Oranges	47	0.1	0.002	150	247	0.11	0.04	54
Wholemilk	118	0.03	0.031	155	490	0.03	0.23	2
Dried skimmed milk	1280	0.27	0.15	1590	122	0.38	1.63	13
Beef average Lean raw	5	2.7	0.01	350	0	0.1	0.21	0

Sources: U.S.D.A.; Japan Nutritionist Association food tables; public analyst data supplied courtesy of Clearspring Ltd; McCance and Widdowson's Composition of Foods (6th edition).

Please note that nutritional assays vary according to maturity of plant at time of harvest, storage techniques, etc.