Star & Furrow

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PREPARATION STIRRING - Research Trials

SPIRITUAL SOVEREIGNTY OF THE FARMER

SUSTAINABLE BEEKEEPING

Feeding the foundation of health

CELEBRATING ITS 10TH YEAR from unlikely start-up as a remote organic food producer, an Anglo-Scandinavian venture called Seagreens® has charted a course somewhere between intuitive faith and commercial reality to effect an innovation in the use of seaweeds in human nutrition and health.

by Simon Ranger

A BALANCED VARIETY OF FOODS is required on a daily basis to give our bodies in turn, not only the balance of nutrients they need to perform their multitude of daily functions, but to avoid and counter imbalances which cause disease. The relationship between balance and health first stimulated my interest in seaweed.

At the heart of biodynamics is the idea that through understanding and appreciating the natural relationship between all that is in this world separate[1], Man, as an intelligent spiritual participant, can play his God-given role in the Creative process, a healing agent for the wholeness which the Cosmos is deemed to be.

Through a joint business venture in the late '90s I found myself far north of the Arctic Circle, among a vast archipelago of Norwegian islands, eagles, elk and reindeer in an ancient fishing community, harvesting wild seaweed. Extensive research had been carried out on its horticultural use, but at the time I was interested mainly in its potential for the human diet. As one of the earliest forms of vegetation, quite different from land plants, many seaweed varieties incorporate a balance of all the nutrients capable of sustaining life.

Among hundreds of seaweed varieties, these cold water 'brown' seaweeds particularly, provide in themselves, a remarkably balanced profile of virtually all the known nutrients[2,3,4], including a significant proportion of 'micro' nutrients like the B vitamins and trace minerals as well as complex micronutrients.

However well the soil is husbanded, these micronutrients may still be deficient in land foods[5,6,7,8], particularly difficult to obtain in special diets, and wholly absent from 'artificial' processed foods. This is because, except by flood, volcanic eruption or other catastrophic event, Nature has few means of replenishing the Earth with these vital components of the balance in our soils[9,10]. Even in biodynamic composting and seed soaking, seaweed is used for this purpose[11]. The effect on plant growth can be easily demonstrated at home by soaking the seeds of bean sprouts overnight with a sprinkling of our granules mixed in the water.

Nutritional imbalance is implicated in all our modern pandemics from autism to obesity as well as our ubiquitous degenerative diseases, not to mention our susceptibility to disease from weak immunity. It behoves us to play our part in the natural and sustainable recycling of nutrients.

The brown 'wrack' seaweeds from our own sustainable harvest, still central in Asian diets as they were once prized in Europe, can help fill all of these nutrient gaps, are easily assimilated[3,4] and contain a significant level of special seaweed polysaccharides, slow-digesting sugars which among other things, aid detoxification and intestinal healing[12]. Off the Lapland coast of Norway, we are fortunate in having a pristine, wild habitat where by harvesting in the summer months we obtain seaweeds in their most active state. Several independent reports have remarked on their exceptional energetic values. They are characterised by their density and slow growth because strong Arctic storms effectively 'cull' the old seaweed each winter.

As all in this world forms into opposites, seaweed mirrors land vegetation in a number of ways. The best seaweeds grow in cooler climes; the best land plants in warmer. A balance of nutrients is only obtained from the land in a wide variety of foods; in seaweed, from a single or a very few species. It is not a matter of 'either, or' but of seeking their combination to balance out the whole. This is why in Japan, in one of the world's most traditional and sophisticated diets, a very small amount of seaweed turns up in almost every meal. Once again, our focus might turn to the relationship between things, rather than to the things themselves, to find our own balance.

Regular, long term dietary inclusion of wrack

What is in it?
Typical nutrient profile of 1 gram Seagreens® mixed seaweed Food Granules

Protein 75mg
Carbohydrate/fibre 700mg (of which the non-starch polysaccharides Algin 230mg, Fucose and Fucoidan 90mg, Mannitol 65mg, Methylpentosans, Laminarin 40mg, Mannuronic acid 270mg) and essential fatty acids EFAs
Vitamins A (antioxidant carotenoids beta carotene, and fucoxanthin, violaxanthin and chlorophyll) 178µg, B group (including B12 Cyanocobalamin 0.004µg, Bc Folic and Folinic acid 0.6µg, B1 Thiamine 0.3µg, B2 Riboflavin 7.5µg, Niacin (anti-pellagra) 20µg, Pantothenic acid, B6 Pyridoxin, Choline) 8.9µg, C (antioxidant) 1.25mg, D (Cholecalciferol) 0.01µg, E (antioxidant) including the complete set of isomers 0.23mg, H (Biotin) 0.30µg and K (Menadione) 10µg
Minerals Calcium 20mg, Chlorine 35mg, Magnesium 7mg, Nitrogen 10.5mg, Phosphorus 1.5mg, Potassium 25mg, Sodium 35mg, Sulphur 30mg
Trace elements include Antimony trace, Boron 0.06mg, Cobalt 5.4µg, Copper trace, Fluorine 0.2mg, Germanium trace, Gold trace, Iodine 390µg, Iridium trace, Iron 575µg, Lithium trace, Manganese 0.03mg, Molybdenum 0.65µg, Platinum trace, Rubidium trace, Selenium 0.15µg, Silicon 1mg, Silver trace, Tellurium trace, Titanium trace, Vanadium 2.3µg and Zinc 0.13mg
Amino acids Histidine trace, Isoleucine 0.53mg, Leucine 5.3mg, Lysine 2.78mg, Methionine 0.68mg, Phenylalanine 0.83mg, Threonine 2.33mg, Tryptophan trace, Valine 2.63mg, Alanine 4.57mg, Arginine 11.17mg, Aspartic acid 4.88mg, Cysteine 0.90mg, Glutamic acid 5.18mg, Glycine 3.90mg, Proline 3mg, Serine 2.25mg, Tyrosine 1.05mg
Betaines Glycine Betaine trace, Gamma Amino Butyric Acid Betaine trace, Delta Amino Valeric Acid Betaine trace, TML (Laminine) trace, L-Carnitine trace, Trigonelline trace; enzymes and valuable compounds which cannot be artificially formulated such as the phenolic compounds including free phloroglucinol, fucophorethols, and phlorotannin derivatives. 1g = 1000mg = 1000000µg

And what is not?
Seagreens® was selected in 2007 for independent Food Innovation studies at Sheffield Hallam University. The research, completed in March 2008, confirmed Seagreens® wrack seaweeds to be free of all the likely ocean-borne environmental contaminants, toxic metals and microbial pathogens (33, 34). When Seagreens® began in 1998 it became "Britain's first organic ocean-to-table seaweed producer" (The Times, October, 2005) and in 2003 was approved for use in biodynamic as well as organic foods and farming systems.

seaweed is reputed to assist nutrient absorption and metabolism, support gut and bowel health, the lymphatic and endocrine systems including the thyroid, help stabilise the acid-alkaline balance, strengthen immunity[13], bind and remove toxic metals including mercury[14,15,16,17,18,19] regulate fatty acid metabolism and electrolyte imbalance, and improve dry skin, listless hair and poor circulation[20].

These indications of research conducted during the past four decades, reflect our own unique experience with Seagreens® over the past 10 years, both in everyday use among the general population, and among practitioners using our products in connection with therapeutic interventions in a wide variety of health conditions. Seagreens® has also shown itself to be non-allergenic and it appears to complement drug and nutritional supplement protocols, possibly assisting their uptake and efficacy[21].

Although my introduction to seaweed began in horticulture, we have focussed almost exclusively on direct human nutrition. We now have a small range of products for consumers and medical and dental practitioners which make it very easy to include a gram or more in the daily diet for the whole family – as a food ingredient, encapsulated food, by inclusion in juices and smoothies, or in salads and other vegetables – or indeed for growing your own.

This contrasts with and complements the culinary uses of traditional Japanese seaweed varieties, but is entirely different from so-called 'superfoods' like wheat and barley grass, chlorella or other blue green micro algæ like spirulina, which are normally the product of fresh water farms where the nutrient profile is similar to that of land plants and to a large extent dependent upon the nutrient content of the growing medium. As an accomplished international marketing man myself, I shun the jargon like superfood which can distort more than it explains.

Our founding business idea was simply *"to get a gram of the best seaweed into the human diet on a daily basis"*[22] and much of what has actually happened has been haphazard and organic, because in any case we never had the funds to pursue a conventional marketing strategy which would have been to establish what was needed by a particular customer group and develop a product to fulfil it. Other people have done just this, for example by extracting fucoxanthin from seaweed and targeting it at weight loss. Equally, Seagreens® should not be confused with common kelp, mostly from industrial-scale harvesting to 'feed' the alginate industry for extracts used in a wide variety of manufacturing applications.

In 2001 a leading pioneer in amalgam-free dentistry discovered that Seagreens® Food Capsules (a wholefood mix of wrack seaweeds) were more effective ▸


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and gentler than his existing protocol which was a combination of nutritional supplements, herbs and occasionally drugs[23]. Its ability to bind and remove toxic metals like mercury was then picked up by practitioners in autistic spectrum disorders where mercury retention is a common problem. That led to clear indications of Seagreens® efficacy in the gut, immunity and hormonal balance[24], whilst others began using it both as a comprehensive source of nutrients and as a detoxifier in cancer therapy, and so on.

As Seagreens® has developed, our focus has begun to broaden. Last year we introduced our first consumer product for cats, dogs and horses, but five years ago Tom Ventham, the dairyman at Plaw Hatch Farm in Sussex, began feeding it to his dairy cattle. We understand it has now reached the farm's wonderful cheeses and indeed, many Sussex cheese lovers! As a result this year we have introduced a discounted direct delivery service for biodynamic and organic farms.

Largely because of a government campaign to reduce salt in the human diet, we approached a number of bakeries because most of the excess sodium was said to be coming from our daily bread! The first and most sincere initiative in this direction came from Artisan Bread, a biodynamic producer in Kent, where Ingrid Greenfield replaced salt with Seagreens® in most types of loaf, ensuring a balance of all the minerals in her bread.

We have begun to supply other, carefully chosen food producers who want to include our branded Certified Ingredients in their own products. These 'Brand Partners' include Beannachar Herb Workshop in Aberdeen which supplies nutritional supplements to children in and beyond the Camphill Communities, Bart Spices in Bristol (who won a West of England Gold Food Award for their mix of rock salt and Seagreens®), and Waitrose which also sells our consumer products!

Salt replacement has now become important enough for Seagreens® to be selected for a government sponsored project at Sheffield Hallam University, once again leading us into new areas of potential. Since 2007, Sheffield's 'Food Innovation' project has been studying natural alternatives to a number of less than desirable ingredients used for taste or expediency in manufactured foods, including salt. Seagreens® proved not only to provide a balance of all the mineral salts, but to behave as a natural preservative, so increasing shelf life, by significantly inhibiting the growth of microbial pathogens, and by stabilising the water content and acid-alkaline (pH) balance of the food[25].

Once again these antibiotic or antibacterial and alkalising qualities reflect our experience in daily use and research carried out elsewhere. A Japanese study in 1986 showed that whereas rats given excess salt died of heart failure, those fed wrack seaweed as well as the salt did not, the seaweed being an antidote to the excess sodium[26].

I was never so obsessed that I believed seaweed to be the panacea for all ills, but even before University, I was interested in the relationship between diet and brain, mind and behaviour, (what goes in, comes out) which led me to explore neurology and psychology, vegetarianism, and most recently traditional Japanese diet and macrobiotics. At a material level, I felt that our seaweed would provide an adequate basis for a brand with integrity, and I coined the phrase *"Feed the Foundation of Health"* which accompanies the Seagreens® trade mark. But having committed "to deliver goodness and value in all our relationships", our ability to match this with spiritual and corporate integrity requires a continuous act of faith, as I quickly found.

In The Biodynamic Food and Cookbook, Wendy Cook suggests that *"When it honours the particular piece of land that forms it, in all its true depth of potentiality, the farm is a world of symbiotic relationships and processes. Then the farm becomes the most excellent, cheap and efficient place to study botany, zoology, chemistry, physics, water, soil, chemistry, nutri-*

Tom Ventham says:

"Winter feeding conventional milking cows was always a complicated science for me at college, balancing intake with maintenance of production and pregnancy, calculating deficiencies and supplementing accordingly. Feeding milking cows on a Biodynamic farm is completely different. We can really only produce milk from what we grow for the cows. The bulk is hay, giving the milk an untainted taste, some oats for energy and beans for protein, and that's it! Choosing the breed is crucial: one that can support itself on this ration. For the 6 months of summer grazing at Plaw Hatch, the cows flourish on grass alone. In my early years here we had problems with fertility in winter, retained placentas, poor coats, general unthriftyness, and taints in the milk. This was a direct result of the poor quality forage we produced which ultimately was a result of poor pastures. Consulting vets suggested among other things, to implant boluses with calcium cobalt and selenium to slow-release over time. We tried a few cows - poor things - with no results to suggest improvements. We tried feeding expensive molasses-based mineral licks which the cows seem to eat at an alarming rate, but still no improvement (the left over buckets were the most useful part!).

I then discovered Simon's seaweed, with its well balanced analysis of just about every mineral and trace element in perfect proportions. I remember offering some in my hand to a cow that licked it clean of every granule before the next cow picked up the scent. So we tried it, and to this day we still routinely feed Seagreens® to all the milking cows (and sows) during the winter and all the problems of fertility and poor coats etc., have gone. I tried to do comparative blood tests before and after, but the results were not conclusive (probably over too short a time period), so I have relied instead on the longer term external effects. I think the main point for me was to understand the function of seaweed in its natural environment, and the detailed balance it provides to correct subtle changes in the cow's constitution. We feed approximately 5 grams per day per cow - and I have about the same!"

tion, cooking, animal husbandry, crafts, climatology, astronomy and true economy; to manage nature's household properly we will need to develop a new and qualitatively different understanding of economic principles'[27]. And that is pretty much what I am facing, too.

In pursuit of an unconventionally slower but steady development, we have nonetheless sponsored a London study into the use of Seagreens® in eczema, and with friends in Germany, horticultural trials against some commercial fertilisers in India. As with our consumer products, much will depend on our ability to respond creatively not only to new challenges of function, but of packaging, regulatory control and delivery. Last year we achieved FDA regulatory compliance and registered our trade mark in the United States at huge expense. With the kind and proactive help of Timothy Brink at the BDAA we also obtained US Biodynamic® and NOP organic approvals.

Like one of those spectacular flowers which takes years to bloom, we can see our business opening out to an increasing variety of partnerships which can benefit from co-operation and take us in exciting new directions – animal nutrition, composting, and healthcare among them. ▸

Research report from NHRDF (the National Horticultural Research and Development Foundation), Maharashtra, India:

Okra and onions are grown on a commercial scale all over India and okra has important export potential. Seaweed and synthetic fertilisers are used but Seagreens® Liquid Purée is a novel product produced directly from whole, fresh, cold wet seaweed without the conventional use of high temperatures and powdering which destroys much of its goodness. Sponsored trials began in 2007 using Seagreens® as a foliar spray against the main competitors, and will be repeated several times to establish a clear result. All of the trials in this series used Seagreens® and the competitors at different strengths, with a control using water and sticker only.

Results from this initial series showed few significant differences among treatments overall, but in both crops the highest yields were achieved using a lower dose of Seagreens® than of the other products. In the okra trials, the highest number of leaves and plant stand at one month and harvest were also achieved with Seagreens®. In onions, the lowest incidence of stemphylium blight disease was recorded using a higher dose of Seagreens®, though no higher than the highest dose among the competitors. Conversely, the consistent highest yield at 15, 30 and 45 days after planting, and the lowest incidence of thripe, was recorded using the weakest Seagreens® solution (less than half the strength of the weakest competing solution). The largest bulb size was recorded using Seagreens® at the medium solution. The names of competing products cannot be published until the completion of all trials.

All photographs © Simon Ringer

Our discounted pricing for biodynamic organisations is not just goodwill, because between us we want to engender new science, applications and products. Where so many commercial enterprises remain 'closed' and guarded in a hostile environment, we are determined to keep this flower truly 'open', discerning at every step the potential in relationships which will add value and goodness to those which already exist. This is, as I have hoped to make clear, a quest not just for a healthier business, but a healthier life. Is it possible to have one without the other?

Everywhere there is a need for mankind to exercise responsible self-governance, not only in political terms, but in the public space, the natural environment, in business and financial management, agriculture, and preventive healthcare. In pursuit of this for the next 10 years, we are beginning a long term programme through which we aim to stimulate conversation about The Foundation of Health from many points of view. We will also encourage greater involvement in our business and decision-making from stakeholders - including consumers, farmers, health and food writers, medical practitioners, researchers, retailers and wholesalers. Above all we will continue to build a business rooted in a spiritual approach to commercial solutions, which remains our guiding purpose for Seagreens®.

I see this flowering in many other places and through many new alliances. Carlo Petrini, founder of the Slow Food Movement which readily allies with biodynamics, has said: *"It is useless to force the rhythms of life. The art of living is about learning how to give time to each and every thing"*. Many of us now see that we do not have to do it all by ourselves – nor do we have the time – but through co-operation great things can be achieved between us. In this turning outward, in the business world as much as anywhere, to place as much importance on relationship as self, I seek the further expression of balance at the heart of society and to lay yet another foundation stone of health.

If you would like further information including details of our special terms for biodynamic and organic enterprises, please contact Seagreens® Information Service: post@seagreens.com or 0845-0640040 (from outside the UK +44-1444-401207). The full article of which this is a slightly shorter version appears at www.seagreens.com. ■

1 R. Steiner, Agriculture Course (Lecture 2), 1924
2 G. Blunden, M. D. Guiry, Seaweed Resources in Europe: Uses and Potential, John Wiley & Sons, Chichester; New York, 1991
3 V. G. Cooksley, Seaweed, A Field Guide to Seaweed, Stewart, Tabori & Chang, New York, 2007 p. 172
4 S. Surey-Gent, G. Morris, Seaweed - A User's Guide, Whittet Books, 1987
5 Daily Mail, London, March 2001
6 The Guardian, February 2006 (quoted in The Week, London, 11.02.06)
7 Changing Diets, Changing Minds: how food affects mental health and behaviour; a joint report of Sustain: the alliance for better food and farming, January 16, 2006, in partnership with the Mental Health Foundation
8 Feeding Minds: The Impact of Food on Mental Health, a report of the Mental Health Foundation (MHF), February 2006
9 H. C. A. Vogel, The Nature Doctor, (Manual of Traditional and Complementary Medicine), Mainstream Publishing Company, Edinburgh, 50th Edition, 1989.
10 D. E. Thomas, The Mineral Depletion of Foods (1940-2002), Nutrition and Health, 17, 85-115, 2003 and research compilation for a London Conference on Obesity, April 2005.
11 For example Peter Proctor and Savdanen Patel in How to Save the World, a DVD about biodynamic farming in India (from BDAA)
12 H. Aihara, Acid and Alkaline, Ohsawa Macrobiotic Foundation, 1986.
13 G. E. Abraham, J. D Flechas, J. C. Hakala, Optimum levels of iodine for greatest mental and physical health, The Original Internist, 2002, 90: 5-20
14 Y. Tanaka et al., The Binding of Lead by a Pectic Polyelectrolyte, Environmental Research 14:128-140, 1977
15 S. C. Skoryna, Y. Tanaka et al., Prevention of Gastrointestinal Absorption of Excessive Trace Elements Intake, Trace Substances in Environmental Health VI, Symposium, (D. D. Hemphill, Ed.), University of Missouri, Columbia, 1973
16 Y. Tanaka et al., Studies on Inhibition of Intestinal Absorption of Radioactive Strontium, Canadian Medical Association Journal 99:169-75, 1968
17 S. C. Skoryna et al., Studies on Inhibition of Intestinal Absorption of Radioactive Strontium, Canadian Medical Association Journal 91:285-88, 1964
18 J. Jellin, P. Gregory, F. Batz, K. Hitchin, S. Burson, K. Shaver, K. Palacioz in Natural Medicines Comprehensive Database, 3rd edition, pp. 27-28. Therapeutic Research Faculty, Stockton, California, 2000 - www.naturaldatabase.com
19 M. Y. Arica et al., Alginates bind heavy metals, Journal of Hazardous Material, 2004
20 J. Tommey, Pure, simple, effective and essential, The Autism File, Issue 21, Winter 2006
21 Summary for Healthcare Practitioners, 22nd Edition, Seagreens®, 2008
22 T. McLoughlin in Organic & Natural Business magazine, Vol. 6, Issue 2, p.21, February/March 2008
23 The late Dr J. G. Levenson initiated the UK's first major conference on the dangers of mercury in 1985; was founder and President, British Society for Mercury-Free Dentistry; Dental Adviser and Executive Committee Member, Environmental Medicine Foundation; member of the British Dental Editors Forum; responsible for the dental sections of the Allergy & Environmental Medicine Departments of the Wellington & Lister Hospitals, London
24 J. Tommey, 'Pure, simple, effective and essential', The Autism File, Issue 21, Winter 2006.
25 A. C. Fairclough, D. E. Cliffe, The potential for the use of Seagreens® wild wrack seaweed as a bacteriostat and its effect on shelf-life, Sheffield Hallam University, March 2008
26 Y. Yamori et al., Dietary Prevention of Stroke and Its Mechanisms in Stroke-Prone Spontaneously Hypetensive Rats - Preventive Effect of Dietary Fibre and Palmitoleic Acid, Journal Hypertens 4(3):S449-S452, 1986.
27 W. E. Cook, The Biodynamic Food and Cookbook, Real nutrition that doesn't cost the Earth, Clairview Books, 2006