

Different seaweeds on the coast of Hokkaido

The trend of FOSHU and Japanese Healthy Diet boom

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INTRODUCTION

Japan is a country well known for its people's longevity and now the Japanese diet has become quite popular

and is being eaten worldwide in foods such as sushi. We are very proud of the status Japan has for longevity which we like to attribute to our healthy diet of macrobiotic food and our food culture. Our long life we think comes from many factors but diet is certainly

at the top of this list. Western countries are now starting to take notice of issues relating to good health in levels not previously seen. Obesity is at record levels throughout the world and health professionals are taking more notice of Japanese and their diets both recently and historically. It is widely known that Japanese foods have many healthy factors.

When this current trend and interest in Japanese style foods was first brought to our attention we thought it was simply a "fad" but after giving it serious thought we realized the nutritional content and balanced food with less calories in our foods compared to western

diets was seen as much healthier alternative and one that could continue on as way of life for the rest of the world to stave off obesity and other diet related illness. Personally I believe since I started visiting Europe that our Japanese diet is similar to the Mediterranean diet, a diet which includes naturally healthy foods that promote and suit our long food cultures. Ethnic foods include many functional and nutritional benefits.

In the 16th century ,during the period of great sea voyages, many Europeans came to Japan. Marco Polo (Italian) reported that Japan had many images made of gold when he first saw fields of seasonal crops, especially ripened rice – it seemed to him that it shone like gold.

Europeans brought many new vegetables and spices to Asia, as well as different ways of cooking. To this day we still keep several European cooking methods like Tempura.

Our Japanese diet is still quite different from western countries. Many people will have noticed that we eat seaweed as part of our unique diet. One of the things I noticed during my travels was a sushi bar was not making sushi using seaweed in their sushi roll which is the norm in Japan, but obviously not a taste yet appreciated in the west so the outer seaweed casing was left off.

THE GOODNESS OF SEAWEED

What is good about eating seaweed?

Are there any differences between land grass and seaweed ?

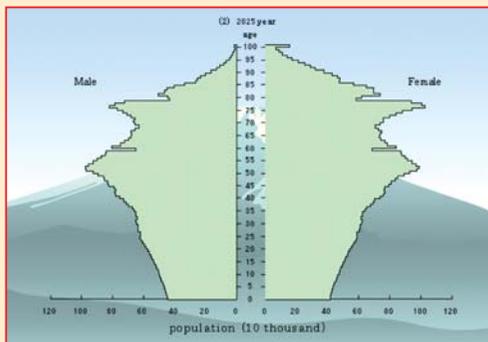
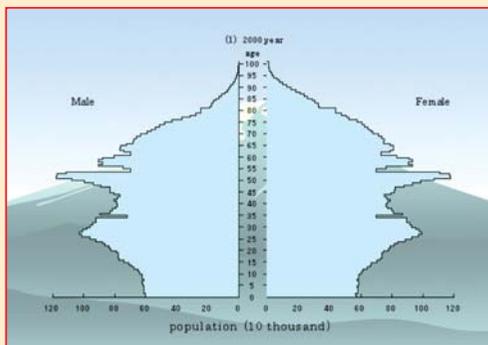
Japanese people say, " Turtle is a perpetual animal " which means able to live a long life. Turtle lifespan has been shortened dramatically due to environmental pollution and contamination of the sea. Recently an article made big news in Japan that a turtle had been found eating polyethylene and other rubbish instead of seaweed. Seaweed is usually a normal part of their diet.

Many mollusk's live on seaweeds, contrary to few animal's that eat seaweed. If they do not eat seaweeds as a food, most animals are lucky to be able to eat fish instead. As humans we have been able to eat fish and seaweed and we have also developed plenty of uses for seaweed.

When you think about it, seaweed is just grass from the sea, only different rules apply to grass on land. First of all seaweed is not the same shape, growth rate is quite different. Do you know the difference between sea vegetable and seaweed? .

Different nationalities incorporate seaweed into their diets in different ways. Some nationalities really love

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to eat sea weed, like the Japanese.

Many years ago for those humans living close to the sea and obtaining their nutritional needs from the sea they found many different way of using seaweed other than in their diets. It was used as fertilizer, for preserving various tools, medicine, chemicals, industrial supply, foods, and also during religious events...so many different kinds of use over a very long period of time. Most of the areas seaweed has been in use for a long time are in the pacific, north European countries only had a small use for seaweed.

Japan has a large coastline with approx 70 different kinds of seaweeds and our ancestors learnt what the best use of seaweed was for our diet from these rich resources. We appreciate seaweed's colour, flavour, and its simple taste. Another nutritional fact is that seaweed does not have much protein and starch and each seaweed has its own unique attributes.

CHARACTERISTICS OF VARIOUS SEAWEED :

a) dietary fibre

Most seaweed contains carbohydrates as the main ingredient, with no fat, plenty of dietary fibre and minerals. It contains much more dietary fibre than common vegetables likely cabbage and lettuce, and when we compare between vegetable and seaweed calcium is likely to be two or three times higher, carotenoid as a precursor of vitamin A is two times higher, and in some seaweeds its over fifteen times higher ...so it's quite a nutritious food.

Normally seaweed is of pitchy, sticky, viscid character, which comes from its fibre. Seaweed experiences high levels of salt and wave/rock action in the sea. We think the sticky, viscous character is to protect the cell and carbohydrates. Usually it dissolves into the sea becoming a liquid. It is indigestible to human beings and we cannot absorb it to be able to use it as a source of energy.

Generally dietary fibre has the following effect of these:

When foods pass through our digestive tract, it takes longer nowadays to pass which is not good for our systems, thus we need more dietary fibre and seaweed in effect gives this. It helps with curbing diabetes which is a major problem worldwide as it reduces sugar levels. It retains a good source of moisture and helps in the control of high blood pressure, and lowers cholesterol. Also it could help to improve our intestinal condition thus helping constipation problems. For example Kelp (Kombu) has indigestible cellulose which is dietary fibre, which contains water soluble alginates. When we cook seafood soup, Kelp makes a pitchy texture in the water. When this is then eaten it moves into our intestinal tracts, it expands and mixes with other foods. It gives good protection to the wall of intestine, then it will make slower absorption of carbohydrate, finally it will help to avoid the rapid increase of blood sugar levels, and protect against the sudden rise of insulinso possibly to help protect against becoming at risk of diabetes.

As well as these effects of dietary fibre, some dietary fibre is fermented by intestinal bacteria, it then produces low molecule carbonates. It's effect is to decrease pH in our intestinal condition. The result of this is it increases the growth of useful bifid bacteria, so it in turn controls the growth of noxious bacteria which produces carcinogen

Also dietary fibre has the effect of retaining the second absorption of cholesterol as secreted bile, it normally keeps, so protective arteriosclerosis .

b) Fat

Generally seaweed doesn't contain much fat, any fat would be of the unsaturated form like alpha linoleic acids, therefore it would be helpful in reducing cardiological symptoms, maybe assist in the control of cancer transfer, and prevention of stress and allergy problems, and also aid in neuronal work, cardiovascular dilation action, cardiostimulant action

c) Calcium

Dried seaweed contains plenty of calcium, records show seven to fourteen times higher than in cow's milk, so it is an ideal source of calcium as a food ingredient.

d) Carotenoid

The volume of carotenoid among seaweed is less than greenish, yellow type vegetables, but more than cabbage and light coloured vegetables. It has the effect of anti aging coming from its antioxidant ability. Generally root crops are typical trans form, but the carotenoid of seaweed is cis form .

e) Other

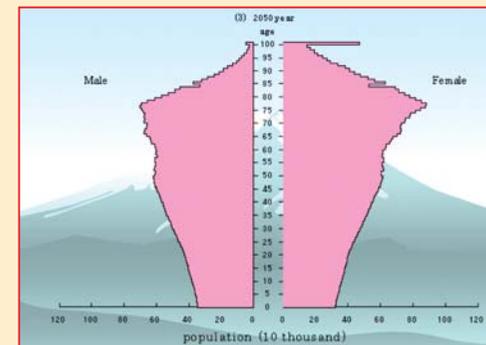
Blood pressure depressant seaweed inhibits the activity of angiogenesis converting enzyme which has the ability to lower blood pressure .

As mentioned above you can see there are several merits in taking seaweed, as a natural product it contains wonderful attributes for our health. Some people wish to take it as a fat reducer when they are dieting but this is not a sensible way of using seaweed, it is best incorporated as a supplement to your every day nutritional intake.

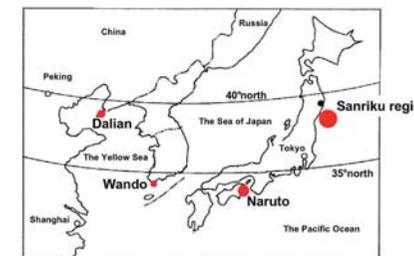
As for people who eat a lot of food that includes much magnesium, seaweed or spinach presented in U.S.A., acylglycerol value was low, and that high density lipoprotein (HDL) tended to become higher. The contents were checked by a study done of about 4600 Americans from 18 years old to 30 years old for 15 years since 1985.

At the moment and under study and experiment using animals Hokkaido National University In Japan are finding one ingredient in marine algae that maybe useful for obesity measures.

Seaweeds grow in the sea; therefore it's quite different from plants that grow on land, it contains



Distribution of wakame



Other regions than the above:

Tasmania (Australia), Wellington (NZ): at latitude 40° south
Brest (France): at latitude 50° north

What is Health Food?



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NUTRITION



Chigaiso



Sphaerotrichia divaricata



Gagome kombu



Hizikia fusiformis

generic brown pigment "fucoxanthin" which is to be found in most seaweed.

Our research group identified that this fucoxanthin acts in assisting weight loss and it tended to help with losses of between 5-10% using laboratory mice. It is thought that fucoxanthin is not stimulating protein to do the work of converting fat into energy.

In addition, it is recognized that fucoxanthin promotes production of DHA which is a kind of polyunsaturated fatty acid.

DHA decreases serum fat and inhibits thrombocytic agglutination ability.

As the result of recent studies and traditional food culture, Japanese strongly believe that seaweed is very good for them.

3. Tokuho which in Japanese is normally called FOSHU: Food for Specified Health Use and is used in medicine also.

For many reasons, Japanese food is very healthy. Japanese are very skillful in adopting worldwide technical trends for processed and nutritional foods. Japan is also the leader of health functional foods like FOSHU.

What is "Food in Japan"? Japan now has food products listed under the Food Sanitation Law of approximately 2 trillion, of which some foods are listed as "health foods".

Pharmaceutical products listed in the Japanese Pharmacopoeias are approximately 7.4 trillion under Pharmaceuticals Affairs Law, this list also contains information used for diagnosis, treatment, and prevention of disease, used for purposes that have an effect on the structure and function of the body.

What are Foods for Specified Health Uses?

- Foods for specified health uses are foods that include functional health ingredients with physiological functions and biological activity of the body and that state claims to the effect that the expected health function can be expected from intake of the food with the intention of achieving a specific health function in eating habits.
- When foods are sold as foods for specified health uses, a screening by the national government must be conducted concerning the efficacy of the individual physiological functions and specified health functions as well as safety etc. and approval must be obtained.

Applicable Scope of foods for Specified Health uses are foods that contribute to improving diets and thereby maintaining or improving the

health of persons who have not yet contracted lifestyle-related diseases, etc. that arise from eating habits or who are on the verge of contraction such diseases.

Among the trend of our FOSHU, there are several that relate to the use of seaweed as an ingredient and likely physiological function using Wakame (seaweed).

The ingredients directed at people wishing to reduce blood pressure.

Physiological functions of wakame are described in published papers :

For example,

Decrease blood pressure: previous clinical studies of the effect of wakame on blood pressure, the effects of wakame ingestion on blood pressure were evaluated by hypertensive immigrant subjects in Campo Grande in Brazil who originally came from Okinawa . The hypertensive subjects received dried wakame powder in 5 g enclosed capsules. In the wakame group, the systolic blood pressure significantly decreased 3 weeks after ingestion by 22mmHg. The diastolic pressure also significantly decreased by 10 mmHg.

Yamori Y. et al., Kyoto. Univ. and WHO.

- decrease the serum cholesterol

- prevent obesity

- prevent cancers

- prevent the absorption and reabsorbing dioxin.

We respect the name of mekabu; Sporophyll of wakame (*Undaria pinnatifida*) what is the physiological functions of mekabu fucooidan . These are known as Antitumor, Antiviral, Antiallergic activities.

Benefits of " wakame peptides jelly " by Riken has prepared evidence based on scientific data, it is also quite safe to use as it is derived from edible seaweed and this has long been an eating habit in Japan. Consumers in Japan trust eating foods from the sea, they are seen as beneficial and healthy and a traditional way of eating for Japanese.

There are several FOSHU products that have lower molecule alginate, which come from seaweed which work as dietary fibre. These ingredients are best for the maintenance of a healthy and gastro-intestinal condition. Fucooidan is contained with "sulfation fucose "and "fucose ", many researchers have noticed to study and notice these are quite effective against cancer. Depression effect of our human cancer is



Makombu, *Laminaria japonica*



Petalonia fasciata



Todorokke, a kind of Wakame seaweed



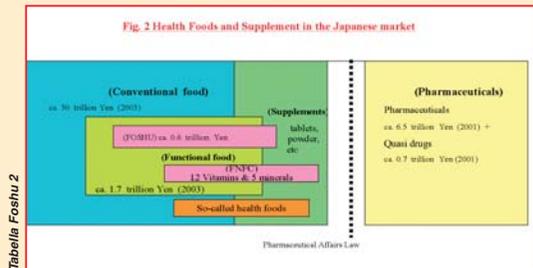
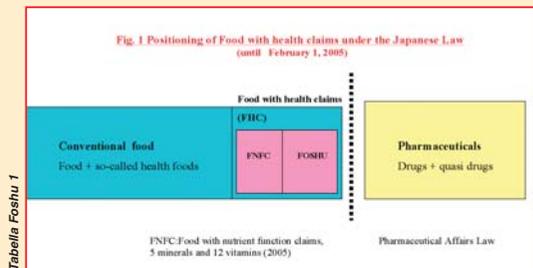
Alaria marginata



Ulva pertusa



Mitsubishi kombu, *Laminaria* spp.



remarkable, and it is said "oneiric anticancer drug" without a side effect. Traditionally every nation has its own unique eating habits. But now we see more interest in Japanese cuisine worldwide and this is a fine thing and can only be good for consumers health and well being in the future.

FOSHU report

1 Positioning of FOSHU

Under Japanese Law, FOSHU is the one category of Food with Specified Health Use claims, as shown below (Fig1). It is food, and clearly separated from pharmaceuticals (vedere tabella Foshu 1).

Pending FOSHU Issues:

- The approval of FOSHU is quite expensive, because a clinical test similar to that for pharmaceuticals needs to be carried out. Efficacy and safety data must also be submitted in the application to the MHLW for FOSHU approval. Hence FOSHU products are approved as scientific evidence-based foods.

- It is generally assumed that it takes at least 1 year to put together enough data to make an application for approval.

- The contents of FOSHU's health claims on food labels are strictly limited and controlled, whilst those on many ordinary kinds of 'health foods and supplements' actually on the market are booming because they actually give pseudo scientific labeling information attractive to consumers to influence their choice. In practice accidents that endanger the health of consumers have been reported in the last few years (vedere tabella Foshu 2).

- The above pending issues suggest that FOSHU products are generally more costly and even a risky investment prior to obtaining permission for marketing. However once they have been approved they become attractive as a "qualified brand" for food manufactures. Additionally the approval is not an ingredient-based but a product-based food product. Our food manufacturers severely select only certain products for FOSHU submission, if they decide to carry it out!

1. EXISTING HEALTH CLAIMS OF FOSHU

- Food appropriate for consumer with maintenance of healthy gastro-intestinal condition
- Food appropriate for consumers with higher blood pressure
- Food appropriate for consumers with higher cholesterol level values.
- Food appropriate for consumers who take care of their blood glucose values.
- Food appropriate for consumers who take care of anemia, and calcium deficiency.
- Food appropriate for consumer with neutral fat improvement of blood after meal
- Food appropriate for consumer with dental health maintenance (tooth decay)

2. FOSHU IN THE COMPLICATED AND CHANGING JAPANESE HEALTH FOOD MARKET

- Our FOSHU market is sharply expanding and prospective. However, as shown in Fig.2, the current market volume of FOSHU is not so large compared to conventional food and the pharmaceutical market. Additionally it still remains smaller than our functional foods market which includes different kinds of lactic acid beverages and yoghurts that show larger sales volume increase.

- Consumer prices for FOSHU are a little bit higher than others, because of its expensive costs to get approval. There is an alternative for food manufacturers not to get FOSHU approval, even though they may have products of quality equal to or similar to FOSHU products.

- For the Japanese Ministry of Health, Labor, and Welfare (MHLW), to review FOSHU is time-consuming work. The review should be completed in about 6 months. However it currently takes a considerably longer time. The speed-up of the approval and review process has been strongly requested, of our government Ministry, by food manufacturer applicants.

3. RECENT REVISION AND EXPANSION OF FOSHU BY THE MHLW

On February 1, 2005, the Japanese MHLW announced its decision to revise our Regulatory system regarding Food with health claims, although the basic frame for food and health foods have remained unchanged. Practically, FOSHU has been expanded and revised as follows:

- A brand for qualified FOSHU products has been established, in addition to the existing FOSHU. Food having specified health uses but whose scientific evidence level is lower than the requirements for existing FOSHU will be reassessed by today's criteria and approved as qualified FOSHU, if justified.
- The new rules to standardized FOSHU has been set up. Realizing that scientific evidence has been piling up, on both ingredients and functional food products for some years, due to previous FOSHU submissions; much of which has been duplicated because food companies submit similar scientific data for equivalent food products. Our MHLW based on their collected scientific database have standardized the ingredients and their functions which they have approval for a significant number of cases, often over a 100 cases which they have screened. Therefore from now on the review of applications by the MHLW for FOSHU approval will be made based on this new standardized database. It will make the review and approval processes simple and short.

- Approval for FOSHU labeling indicating "a reduction of disease risk"

The labeling of reduction of a disease risk is to be approved, when the relevant ingredient is fully recognized from both the medical and nutritional standpoints to provide a risk reduction of the specific disease. At present, calcium and folic acids are approved.

The reasons that the above system has been introduced: Labeling of reduction of disease risk has been approved for some ingredients in the USA. Additionally, the Codex Labeling and Claims Committee and the EU are both finalizing their recommendations to approve similar labeling claims. Then Japan will also approve this type of labeling in order to provide clear information to consumers, expanding their options on labeling.

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