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## Fermented foods are “Japanese-superfoods”

~Fermentation creates 3 “bio” benefits~

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**S**uperfood has been attracting a great deal of attention in Japan for several years. When you visit a health expo, you can find many booths promoting superfoods. This issue will include topics about supported superfoods in the world and Japanese-superfoods.

### ◆◇ Superfood is a general term to describe foods with excellent nutrition in terms of both quantity and quality

Lately, many women's magazines and health magazines include the word of “superfood”. Some of you may wonder about the difference between superfoods and other foods. The Japan Superfoods Association defines superfoods as the following:

- The food with an excellent nutritional balance, and its nutritional value or a particular nutritional component/ health-enhancing component in it is higher than other general foods.
- The food that falls between general foods and supplements, and is intended to be used for both cooking ingredients and health foods.

The superfood term became common use by doctors and nutrition scientists who are involved in studies on diet therapy in the US and Canada in the 80s. Subsequently, raw foodism and the concept of living food started a boom in the US and superfoods became popular because they matched to the serving idea that those concepts advocated. Spirulina, cacao, coconut and Chinese matrimony were listed as examples of superfoods in *Superfoods* (2009), a book that familiarized the public with the term “superfood”.

Basically, superfood does not define a particular name of food but describes “mainly vegetable-derived foods that contain higher levels of health-enhancing components and essential nutrients like vitamins, minerals, chlorophyll and amino acids than common foods”. The type of food that enters into the superfood category varies depending on people and organizations who advocate superfoods. The following chart shows some famous superfoods that entered to Japan from the US.

Names of foods	Characteristics
<b>Spirulina</b>	Spirulina is an alga and has been placed on earth over 3.5 billion years. It contains more than 50 nutrients like amino acids, vitamins, minerals, dietary fiber and unsaturated fatty acids.
<b>Cacao</b>	2 types of cacao are available: cacao powder and cacao nibs. The anti-oxidant components in cacao like polyphenols and vitamin E have been receiving increasing attention. Zinc and other vitamins are also found in cacao.

<b>Hemp seeds</b>	Hemp seeds are rich in $\alpha$ -linolenic acid and become a protein source. Their oil contains essential fatty acids: linoleic acid and $\alpha$ -linolenic acid, at an ideal balance of 3:1.
<b>Chinese matrimony</b>	The fruits of Chinese matrimony have been prized as a medicine in China over 3000 years. They contain abundant components: carotenoids, vitamin C, B-complex vitamins, amino acids, iron, dietary fiber and beta-carotene.
<b>Chia seeds</b>	Seeds of Chia which is a species of flowering plant in the mint family, Lamiaceae. Chia seeds bloat to 10 times its initial volume and turns into a gel. A component of the gel is dietary fiber called glucomannan. The oil from Chia seeds are rich in $\alpha$ -linolenic acid.
<b>Acai</b>	Acai belongs to a species of palm tree native to Brazil. It contains abundant anthocyanin which is known about its anti-oxidative effect. It is also enriched by iron, calcium and vitamin E. Acai is excellent with other fruits and drinks.
<b>Coconut</b>	Coconut water contains a lot of potassium and many people drink it during sports. The metabolism of coconut oil is fast because it includes abundant medium-chain fatty acids. This is helpful for our body to burn fats.
<b>Broccoli sprouts</b>	Broccoli sprouts contains a lot of sulforaphane which is essential for detoxification. 3 days after germination, the sulforaphane level reaches to its peak. Broccoli sprouts are a suitable topping on many different dishes.

Many superfoods have entered to Japan, but there is also a superfood in Japan which contains higher nutrients than other foods and have been used as a medicine. “Fermented food” is exactly a Japanese version of superfood.

### ◆◇ 3 “bio” properties of the Japanese version of superfood

Traditional Japanese fermented foods are made from plants and went through many years of fermentation by microorganisms. Therefore, proteins and carbohydrates in the fermented foods are degraded to smaller molecules that are easily absorbed by the body. The nutritional value including amino acids and vitamins increases during the fermentation periods. Moreover, microorganisms which are the starters of the fermentation such as kouji mold, yeast and lactic acid bacteria play important roles to regulate our intestinal balances. Miso, for instance, is made from soy beans that are degraded by kouji mold and then fermented by yeast and lactic acid bacteria. Natto is also made from soy beans but is fermented by bacillus subtilis natto. Pickles are fermented by lactic acid bacteria that adhere to the ingredient vegetables. As these examples, numerous microorganisms encourage plant-based ingredients to produce beneficial substances which in turn make them be nutritious supper foods.

There are three “bio” properties engaging fermented foods to be superfoods: probiotics, prebiotics and biogenics.

#### □ Probiotics

Probiotics are microorganisms that are delivered live to the intestines and provide health benefits when consumed. The characteristic of probiotics is that they do not originally reside in the intestines and do enter the body through an act of intake. Fermented foods include kouji mold, lactic acid bacteria, yeast and bacillus subtilis natto. Once these microorganisms are delivered live to the intestines, they regulate the functions of the intestines and facilitate immune modulation. You have to be aware that preservative agents are often added to the fermented foods that are fermented in a short period of time.

□ **Prebiotics**

Prebiotics are food compositions that induce the growth or activity of good bacteria which cohabit in the intestines of the host. Oligosaccharides and dietary fiber, for instance, become nutrients for bifidobacteria residing in the intestines. Inulin and resistant starch nurture the intestinal bacteria belong to genus *Bacteroides* which earned a nickname in Japan as sliming bacteria. Soy bean which is a raw material of miso, soy sauce and natto contains abundant dietary fiber and oligosaccharides. Pickles are also a good sources of dietary fiber because they are made by vegetables. Moreover, amino acids and vitamins which are produced during the fermentation periods become nutrients not only for humans but also for microorganisms living in our intestines.

□ **Biogenics**

Many of you are not familiar with the term “biogenics”. It means the components directory work for the intestines which in turn facilitate an activation of the body’s immune system and exert an antioxidant effect. The dead bodies of lactic acid bacteria which occur during the fermentation also directory stimulate the immune system in the intestines. The fermented foods which went through long fermentation and maturation periods contain accumulated dead bodies of the microorganisms. Therefore, the body’s immune system can be greatly stimulated once we have such fermented foods. Furthermore, a brown pigment composition called melanoidin is produced during a long fermentation and maturation periods. Malanoidin has a strong antioxidant property which will be effective to counter aging.

Nowadays, there is a growing recognition of Japanese fermented foods as Japanese-superfoods. The following list includes foods containing high nutritional values that deserve to be classified in superfoods.

Names of foods	Characteristics
<b>Barley</b>	Barley contains abundant soluble dietary fiber. Main component is $\beta$ -glucan which is effective to suppress the elevation of blood cholesterol, control sugar level in the blood and improve intestinal conditions.
<b>Green tea</b>	Green tea contains catechin which is one kind of the polyphenols. Catechin is effective to suppress the elevation of blood pressure and blood sugar. It also prevents aging, bad breath and caries.
<b>Sake-kasu(sake lees)</b>	Sake-kasu is the lees separated from sake during the production. It contains proteins, vitamins, minerals and dead bodies of kouji mold, yeast and lactic acid bacteria which were involved in the fermentation process.
<b>Brown rice</b>	The level of vitamins, minerals and dietary fiber contained in brown rice is more abundant than in white rice. It is often called full nutritional food. Phytic acid in brown rice egests a harmful metal.
<b>Umeboshi(Japanese pickled plums)</b>	Umeboshi is pickled ume fruits which are a species of fruit-bearing tree in the genus <i>Prunus</i> . It contains citric acid that is helpful for a recovery from exhaustion and has antioxidant and antiseptic effects. Also, dietary fiber, sodium and potassium are found in it. Umeboshi is effective to improve blood flow and activate the immune system.

<b>Sesame</b>	Research studies have reported sesame lignan is effective to remove reactive oxygen species. It contains also quality unsaturated fatty acid, proteins, minerals, calcium and dietary fiber.
<b>Nori(seaweeds)</b>	Nori is edible seaweed species of the red algae. It contains proteins which are the equal quality to soy protein. It also contains calcium, magnesium, iron and micronutrients like zinc, and contributes balancing minerals in the body.
<b>Pickles</b>	Organic acids including lactic acid and acetate are produced by going through the fermentation with lactic acid bacteria. It can help for a recovery from exhaustion, exert an antiseptic effect and improve intestinal conditions. It is rich in dietary fiber from vegetable ingredients.

The most effective food to enhance your health and beauty is your native food. It is important for Japanese people to take more Japanese-superfoods including fermented foods for maintenance and improvement of health. Why don't you use this opportunity to review your own native food? You may find a new beneficial food for your health!