

Las Propiedades que nos ocultan de la STEVIA

marzo 26, 2008 por [joseppamies](#)

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5 Votes

En el texto en ingles (lo siento no tengo medios para traducirlo) ,que adjuntare al final de este post, podrán encontrar decenas de aplicaciones saludables de la Stevia tanto en personas , como en animales y plantas.

Muchas de estas aplicaciones se han descubierto como consecuencia de un hallazgo fortuito.

Un agricultor japonés se dio cuenta que unos niños de una escuela, comían por primera vez mandarinas de un árbol que siempre las había dado agrias. Al preguntarse porque de pronto aquel árbol daba mandarinas dulces, observó que debajo del árbol había depositadas ramas de Stevia que el tiraba allí a modo de compost cuando las podaba.

Al descomponerse estas ramas con el paso del tiempo, aportaron a las raíces del mandarino unas sustancias naturales que convirtieron las mandarinas agrias en dulces.

Este descubrimiento a desencadenado todo tipo de utilizaciones inimaginables de la Stevia básicamente en Japón y de forma incipiente en Paraguay.

Frutales rociados con extractos de Stevia dan frutas con mas grados brix de dulzura que no se oxidan al cortarse, animales alimentados con stevia reducen su componente graso de sus carnes y mejora su salud



, cuentan que descontamina los suelos de la contaminación química (dioxinas) , e infinidad de experiencias en enfermedades humanas de muchos tipos, etc.

Es al menos curioso que incluso en España sea legal el consumo de la Stevia por los animales y nos sea negado disfrutar de sus propiedades a las personas.

En base a estos datos en Huesca, el cocinero **Ismael Ferrer** y miembro de Slow Food, ha comprobado que rociando fruta pelada con extracto de Stevia ,esta no se oxidaba .

Esta primavera empezaremos en Lleida pruebas con verduras , frutales y piensos para alimentar animales , para comprobar lo que en dicho texto que les adjunto se asegura como Revolución en Japón

An English Translation of a Book Titled

The Food Revolution in Japan
Stevia, The Savior for Food Life and Health

The actual proofs of experiences in Japan will also be useful
for activating towns and villages all over the world

Published by President, Ltd., Tokyo, Japan

by
Naohiko Sato, Author
President, JBB Research Institute of Immunizing Plants
Supervised by
Dr. Masaaki Takeuchi
Professor emeritus of Tohoku University

<Words from the Supervisor >

The 21st century is said to be the era for food and environment. These are the global themes for the mankind to live a healthy and wealthy life, and the overriding themes all the people in the world to pursue with all their wisdom combined. I believe the author must have had penetrating eyes to point out these important problems when he wrote this book.

I met the author Mr. Naohiko Sato about 10 years ago. Since then, he often visited our laboratory (The laboratory of Fishery Chemistry, Faculty of Agriculture, Tohoku University), and inspired by his great enthusiasm to study Stevia, I decided to launch a Stevia research project in our laboratory.

A series of our examinations scientifically proved that Stevia Extract Liquid had a strong anti-oxidizing activity and a detoxifying activity against histamine, although the mechanism of such activity is still to be clarified.

This book describes the huge applicable possibility of Stevia based on the author's long experiences and scientific evidences. It gives us a clear impression that he is trying his best to combine the themes of food, agriculture, and health by the chain of Stevia, and to contribute towards solution of the food and environment problems the world is facing.

The author also has his strong intention, and has already started his plans in some areas in Japan, to help activate the industry and economy of town and village communities with Stevia to increase employment as well as to enhance health. He is trying to carry out his plans internationally for activation of the industry in developing countries. He is willing and spares no effort to provide all the know-how that he has acquired to these communities, and to support the unfortunate with some of returns that he will get from Stevia business.

I cannot deny that some of what are written here are still to be scientifically clarified, but I hope this book will be of any help for the development of the societies.

July 2000

Masaaki Takeuchi, Dr. Ph., Professor of Tohoku University, ret.

<Preface>

There are many problems with agriculture in Japan. They are deteriorated soil, too much use of agrochemicals and chemical fertilizers, pollution of ground water, dioxin and harmful chemical contamination, suspected safety of imported gene-modified foods, too much use of antibiotics for farmed livestock and fish, etc.

The biggest of all the problems is polluted foods such as vegetables, fruit, meat, and fish, with less taste and nutrition than they should originally have. They are increasing risks to spoil our health. We cannot have real health without the change of our diet. The change of our diet means the change of food materials.

We must act now. And we have found the solution, namely Stevia.

Stevia is the generic name of a perennial plant with the scientific name of "Stevia rebaudiana Bertoni" which is a composite plant growing in Paraguay of South America. Its component extracted from the leaves has been widely used as a natural sweetening alternative. But I found a very miraculous power in the stems of Stevia. I manufactured Stevia Extract Liquid to get the power, and got the method patented. Now Stevia powder, mixed with manure, is applied to fields, or Stevia Extract Liquid is sprayed over leaves of plants to get the exhausted soil restored with much more useful microbes and earthworms and to grow plants in a healthy way. Sugar content in fruit is increased, tastiness of rice is improved, and content of vitamins and minerals in vegetables is increased. On top of that, they stay fresh longer. Stevia dissolves and detoxifies agrochemical residues in the soil or on the leaves and fruit to provide chemical-free, safe products.

When Stevia is fed to domestic animals and farmed fish in powder or extract liquid, it accelerates their growth, prevents diseases, and improves the meat quality.

Surprisingly, many of the farmers who were using Stevia materials for agricultural plants and animals started to use Stevia Extract Liquid for themselves, expecting similar good effects on plants and animals. I received encouraging letters and faxes from them:

- ◆ With Stevia Extract Liquid applied to burns and rashes, they were soon cured.
- ◆ Skin eruptions caused by agrochemicals and bug bites were also cured.
- ◆ Constipation was cured soon with Stevia Extract Liquid.
- ◆ The condition of stomach was improved with Stevia Extract Liquid.
- ◆ Stevia Extract Liquid got rid of fatigue.
- ◆ After taking a bath with Stevia Extract Liquid poured in the bath, dry skin got smooth.
- ◆ The body was kept so warm up after the Stevia bath I could sleep much better.
- ◆ When they drank Stevia Extract Liquid before sprinkling agrochemicals, the body conditions got improved.
- ◆ After their work they could enjoy drinking with no hangover.

Much encouraged by these reports, I launched joint research projects with universities and research institutes, and distributed Stevia Extract Liquid samples to many people for experimental application to confirm these cases of efficacy reported to me. As the research and examinations went on, scientific findings on the efficacy were made one after another. As a result, it was found that Stevia would find a very wide range of applications in many fields. I came to have a firm belief that if Stevia was used all over the world, it would solve many problems that the world was facing, and save the earth and the life. So, I made up my mind to devote my whole life to the contribution towards solution of these problems for the earth and the life on earth. Here is what I had in my mind on how to contribute:

1) Let's Bring Our Towns and Villages Back to Life Again.

With cultivation of Stevia plants, production of Stevia Extract Liquid and Stevia powder, and application of these products to many fields of industry, Stevia can activate the economy and the industries in the involved communities by creating new jobs and income especially in developing countries as well as in depopulated rural areas in Japan.

2) Let's Restore and Revive Exhausted Land to the Soil of 100 Years Ago.

Most of the farmland in every part of the world has been exhausted by too much use of chemical fertilizers and agricultural chemicals for a long period, resulting in less and less fertile soil with less useful worms and microbes. Stevia products dissolve harmful chemicals in the soil and revive such useful worms and microbes to fertile land of 100 years ago.

3) Let's Solve the Food Shortage in Developing Countries.

Stevia products increase production of agricultural and livestock products, and help solve the problem of food shortage in developing countries.

4) Let's Prevent and Improve Modern and Chronic Diseases.

Stevia Extract Liquid contains surprisingly much of anti-oxidizing ingredients to inhibit active oxygen activity, which causes various diseases and accelerates aging. It has also a strong activity to kill food-poisoning bacteria such as E. Coli O157 and salmonella, anti-HIV activity, and a detoxifying activity against histamine, which causes various cases of allergy.

5) Let's Make the Polluted Earth Clean.

Stevia Extract Liquid dissolves nicotine and agrochemicals, and detoxifies dioxin. It may dissolve or detoxify other harmful chemicals as scientific research progresses. Stevia is expected to save the chemically polluted earth.

Now I have a big dream. If Stevia projects are promoted all over the world and become successful with the cooperation of all the people involved, I would like to make some contributions out of the income from the Stevia business to those who are suffering from physical handicaps, poverty, famine, diseases as well as to educational promotion for children in developing countries.

What is the most important right now is the integration of agriculture, food, and health. I firmly believe that Stevia can do this. I will challenge every possibility of Stevia that I believe in.

May I take this opportunity to extend my gratitude to those who have supported me in my study on Stevia as well as everybody who kindly accepted my interviews in preparing this book?

The author, July 2000

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Chapter 1 Discovery of Miraculous Power of Stevia

1-1. Pitfalls of Modern Agriculture

Agricultural chemicals and chemical fertilizers are so threatening/Fear of harmful environmental hormones and dioxin/Materials to remove the demerits of organic agriculture are now in keen demand

Agricultural chemicals and chemical fertilizers are so threatening

The soil is the foundation of agriculture. Agricultural produce full of vitality comes only from good soil.

Is the farmland in Japan exhausted by too much use of agrochemicals and chemical fertilizers?

It is the fact that the modern agriculture has been developed by use of agrochemicals, chemical fertilizers, and agricultural machinery. With these weapons, farmers have won the fights against diseases, harmful worms and insects, and have reduced their labor substantially. They have come to be ready to stably supply agricultural produce at a low cost.

Let's start with the agrochemicals. What are agrochemicals used for? Firstly, for mass production and stable supply at a low cost, namely for high productivity. Without agrochemicals, the price of rice would be 2~3 times higher.

Secondly, for better appearance of agricultural products. Consumers are also responsible for this. For example, they do not like worm-eaten products, vegetables not in a good shape such as bent cucumbers, or fruits having a bloom. So, these products are not acceptable in vegetable and fruit markets. Farmers say that they have no choice but to use agrochemicals to produce and ship good-looking products free of worm-eaten damage to the markets.

Thirdly, for prevention of disease and insect damage to be caused by repeated cultivation of the same crop on the same ground. The increasing tendency is that farmers specialize in cultivation of one kind of farm products and continue to crop it every year. During this repeated cultivation, the specific plant absorbs some specific nutrients in the soil, resulting in loss of the nutrient balance in the soil in the long run. This unbalance will reduce the soil power and generate more disease injury as well as noxious insects, worms and bacteria. Hence a vicious circle of much use of agrochemicals for disinfections, further soil degradation, and more use of agro-chemicals.

For example, clubroot multiplies by its resistance increased by repeated cultivation, and tends to exhibit its outbreak. To prevent this, fumigants such as methyl bromide and chloropicrin are used. These chemicals kill harmful insects, worms and bacteria but also useful microbes in the soil.

Next, let's talk about chemical fertilizers. Nitrogenous fertilizers produce an immediate effect on faster growth and substantial increase of crop. That's why farmers use much of them. But unlike organic manure, chemical fertilizers are not so good for useful microbes in the soil.

Modern agriculture depends heavily on agrochemicals and chemical fertilizers as mentioned above. But there have been many problems arising from too much use of them. At present in Japan, organomercury

compounds and cancer-causing chemicals such as BHC and DDT are banned in production and use. Harmful substances contained in organophosphate and organochlorine agrochemicals are accumulated in the soil as a result of long use of them, and pollute farm products and underground water. When they are taken into people, they affect their health. One of the representative examples is an increased case of allergy such as atopic dermatitis. The agrochemical residues in farm products are reported to be one of the causes of carcinoma of the gall bladder and liver cancer. Especially for growing children, the effect is more severe. According to the Environmental Working Group (EWG), more than 10 million children in the world are taking in organophosphate agrochemicals (nerve-poisoning insecticides) every day at a higher level than the maximum level allowed for adults. "The Earth Environment Outlook 2000" prepared by The United Nations Environment Plan (UNEP) in 1999 warned that about 5 million people in the world are suffering from acute agrochemical toxicosis. It also pointed out that too much use of chemical fertilizers, especially nitrogenous ones, is producing a grave effect on the ecosystems. Nitrogen is an ingredient indispensable for plant growth. There is any harmful effect of nitrogen on plants when ammonia is naturally produced in the soil from nitrogen contained in the air, because this much of ammonia is eaten and dissolved by the nitrate-forming bacteria in the soil which is one of the useful microbes. But when nitrogenous fertilizers are used too much and excessive ammonia is produced in the soil, too high content of ammonia in the soil causes poisoning of plants and spoils their roots.

Phosphor and sulfur oxides contained in chemical fertilizers are melt into water in the soil, and react on metals into salts. Under too high content of salt in the soil, plants cannot absorb water and are killed. This is so-called "Salt injury."

According to the investigation carried out by Prof. Tatemasa Hirata of the System Engineering Faculty of Wakayama University, who is also a member of the National Environmental Research Institute of Environment Agency in Japan, the density of nitrates in the underground water may exceed a dangerous level of 50 ppm in the area where more than 1 ton of nitrogenous fertilizers is used per 1 ha every year. Nitrate is generated in the process of ammonia dissolution. There is no harm to men and beasts in the natural world. When too much of it is artificially generated, it combines with hemoglobin which is an important ingredient of red blood cells, prevents oxygen transmission through blood vessels, and causes malignant anemia. In Europe, there have been some cases of death of children who drank underground water which contain much of nitrates. The WHO (World Health Organization) reported that 160 people were killed by nitrate-contained water during 40 years up to 1985.

According to the experiment carried out by Toshiyuki Maruoka, a chief researcher of the Foundation of New Medicine which studies prevention of E. Coli O157 which causes food poisoning, E. Coli O157 multiplies much more in the soil for which much chemical fertilizers have been used than in normal soil.

Fear of environmental hormones such as dioxin

About 80,000 kinds of chemical substances are said to exist on earth. For the past 100 years, they have been produced and spread all over the world, many of which have caused pollution of air, soil, sea, rivers, and lakes. They have been taken into, and accumulated in, all the creatures on earth, resulting in damage to their living body functions.

Only up to recent years, research on harmfulness of these chemicals had been carried out in terms of ppm, but not in terms of parts per billion. But very recently, dioxin was found to be harmful for man in terms of nanoparts.

Dioxin is one of organochlorine compounds, and is produced unintentionally in chemical factories. In many cases, it is generated when plastics such as polyvinyl chloride are burned at 600°C or lower. It has much stronger toxicity than potassium cyanide, and is said to be the strongest poison that mankind has ever produced. In 1983, dioxin was detected in the ashes of a garbage furnace for the first time in Japan, and was reported as a very big problem.

Dioxin does not dissolve easily in the human body, and will be accumulated for 3~10 years to spoil the generative function. Especially for women, it may affect fetuses and cause birth of deformed children. It may also disturb normal secretion of growth hormones for babies through mother's milk contaminated by dioxin. For men, it may reduce the number of sperms.

Dioxin discharged from chimneys of garbage furnaces falls on the nearby land, rivers, and lakes, and gets into the sea to pollute plankton. It accumulates in the fishes that eat such plankton. It may be spread over farm plants, or may be absorbed into them through their roots in the contaminated soil. Dioxin-contained factory exhaust water pollutes the underground water.

On top of dioxin, recent researches have revealed that about 30 kinds of other harmful chemical substances are known to act toxically as environmental hormones in terms of nanoparticles to spoil the generative function of animals and plants. For example, very few conches are recently caught on the seashore of the northern part of Japan. Upon investigation, it was found that a harmful chemical substance diluted billions of times in the sea acted as an environmental hormone to affect their generative hormone, and generated the male function in female conches, resulting in discontinuation of laying eggs. Another examples are that alligators living in a lake in the southern part of USA were decreasing in number due to shortened penis, and that many fishes caught in a river near Tokyo had the functions of both producing sperms and ova. A shocking TV program recently showed that sperms of 40-year-old Englishmen observed under microscopy were normal in number and activity, while 18-year-old guys' ones were half in number and not so active.

Materials to remove the demerits of organic agriculture are in keen demand

In spite of all the problems stated above, agrochemicals and chemical fertilizers can not be totally eliminated. Of course, agriculture without any agrochemicals is most ideal, but for mass production and stable and low-cost supply of farm products, it is almost impossible to cultivate agricultural plants without any agrochemicals.

Then, what is the solution to this dilemma? Some people say organic agriculture could be the answer. There are many farmers in Japan who are challenging the organic agriculture without any agrochemicals and chemical fertilizers. They are making the best use of natural resources only in the same way as old days when such artificial materials were not available. But from the viewpoint of agricultural management, it is very difficult to enhance the productivity and produce safe and tasty farm products at the same time.

Organic manure is mainly made of excrements of domestic animals. But they include much of sodium and potassium, which gets accumulated in the soil as various salts when organic manure is used in a large quantity. When these excrements are used directly without the process of fermentation, they cause 37% of the soil pollution according to the research report "The Soil and Underground Water Pollution and the Preventive Measures" prepared by the Environment Agency of the Japanese Government. In addition, antibiotics and growth-accelerating hormones, which have been abundantly administered to livestock, are excreted in their dung and have been accumulated in the soil to be absorbed into farm plants. They not only do damage soil but also are reported to do harm to human bodies. That's why organic manure made of racing horse excrements, which are free of any chemicals of such kinds, is very much sought after and marketed at a high price.

Another problem is that use of crude excrements generates harmful gas in the soil and attracts insect pest, and insufficiently fermented organic manure generates much of microbes in the soil resulting in lack of nitrogen, which may cause disease injury. Even completely fermented organic manure does not have the power strong enough to activate microbes in the soil.

There are so many problems as mentioned above in promoting organic manure, though there are increasing voices from consumers and farmers for safety and delicious farm produce.

But here is the ideal material "Stevia" to meet these imminent needs! When it is mixed with organic

manure, it helps the organic manure function more effectively, enhances useful microbes activities in the soil, and inhibits the harm arising from agrochemicals and chemical fertilizers even when they are minimally used. When Stevia Extract Liquid is sprinkled over farm plants or Stevia powder is spread over the farm land in a timely manner, the Stevia farm material provides healthy farm products of natural taste, free of harmful chemicals, that consumers and farmers have long been seeking after.

1-2. The Background of Development of Stevia Agricultural Materials

Stevia agricultural materials that activate “the soil,” the basis of agriculture

The Stevia agricultural materials are condensed and fermented extract liquid and powder made of a composite plant “Stevia.” Details are explained later.

The Oita Prefecture Forestry Experiment Station carried out an experiment in October 1995. Sawdust is rather difficult to be made into organic manure. Twenty-one kinds of samples with Stevia powder and 20 kinds of microbe materials mixed in sawdust and the sample of sawdust only as a control were prepared, and the experiment was carried out to compare how well each of the samples would be made into manure. The result was reported to prove that the Stevia-mixed sample showed the far most activation of useful microbes originally existed in the sample among all the other samples.

Another test was performed in an organic manure center in Kumamoto Prefecture to add Stevia powder to cow dung for making organic manure. The result was very good manure made with microbes fully activated in a short period.

Earthworms act in the soil to till the land, to eat organic materials in the soil, and to excrete feces or soil pellets. These feces are good feeds for useful microbes and good manure for plants. Earthworms also take in nitrogen in the air, and make nitrogenous compounds which provide nutrition to plant roots. They make the soil porous by excreting castings or pellets to help air and water get into the soil. This is called the “Pellet-generating effect” of softening the soil. But without normal activities of microbes, earthworms cannot get activated.

Then, how does Stevia activate the soil and get rid of the harm of chemical substances? I should like to talk about Stevia first.

What is Stevia?

Stevia is the generic name of a perennial plant with the scientific name of “*Stevia rebaudiana* Bertoni” which is a composite plant growing in Paraguay of South America. It grows up to 80-100 cm high, and puts forth white and small flowers. There are 154 kinds of Stevia, but only the ones growing in Paraguay contain a lot of sweetness in the leaves. Native Indios there call Stevia Caa Hee (which means honey leaf) and have been using it as a natural sweetening alternative and a herb for the past several hundred years. In the 16th century, Spaniards came to settle in Paraguay, learned about Stevia from the natives, and started to use its leaves as a sweetener for tea, drinks, and cooking. They called it Yerba Dulce (sweet herb).

A scientific paper by Prof. Crugar of the University of Argentine reads that boiled Stevia juice improved various diseases and cornified skins, and relieved pertussis. Dr. Michel in Paraguay presented a paper in the International Congress of Diabetes in 1970 that the soup of boiled Stevia leaves showed an outstanding effect on diabetes. Prof. Hitoshi Shibata of Tottori University, Japan, pointed out in his paper that Stevia has an unusual metabolic function in its leaves which are 3 times more active in its chlorophyll bodies than other plants, and that mevalonic acid is produced 3 times more in its chlorophyll bodies with excessive mevalonic acid remaining to synthesize the sweetening after various stages of process.

Stevioside, the sweetness component chemically extracted from the leaves, is white powder having 250-300 times sweeter than sugar, tastes like sugar, has only one-ninetieth calorie of sugar, and has a

molecular formula of C₃₈H₆₀O₁₈.

The Ministry of Agriculture, Forestry and Fisheries in the form of seeds and saplings first introduced Stevia into Japan from Paraguay in 1971. Its leaves were intended to be made into a natural and safer sweetener as a better substitute of artificial sweeteners such as saccharin and cyclamate, which were reported to cause cancer. Since then, the Stevia sweetener has been widely used for soft drinks, snacks, pickles, health foods and pharmaceuticals, etc., under the name of “non-sugar,” “sugarless” or “Stevia contained.” So, stevioside is generally called Stevia.

But Stevia stems, which were thrown away as useless refuses after leaves were taken, were found to have an outstanding anti-oxidizing activity and other medicinal effects by our research. Here is a story about how I started to study Stevia.

Incidentally I came across a chance to have a talk with a Stevia-cultivating farmer. He said, “There is a very interesting story. Children were getting excited under an orange tree in an orange field. I asked what’s up. They said that all the oranges of that tree were sweeter and tastier than other ones. But why? I just put the Stevia stems around the base of the tree last fall.” I lost no time to measure the sweetness of the oranges on a tester. Wow! One or two degrees up! He was so surprised at the result. “Unbelievable” was his response. The children’s tongues were accurate. I heard another story about hens. A farmer spread Stevia many stems on the floor of his hen house, and hens laid more eggs with better taste. Inspired by these mysterious stories, I started to concentrate on the study of Stevia.

Birth of Stevia Extract Liquid

I tasted powdered Stevia stems. Sweet! I asked a friend of mine who was a veterinarian to feed cows and pigs with Stevia stem powder. After half a year, I received his report that they grew faster with more appetite and without diseases.

At the same time, I requested an agricultural experiment station to test on farm plants various kinds of manure mixed with Stevia leaf powder, with Stevia stem powder, with a mixture of them in different ratios as well as boiled and condensed Stevia liquid. After a series of trial and errors, I found that powdered stems and leaves were more effective than stems and leaves, and that a mixture of powdered stems and leaves was more effective than powdered stems or powdered leaves alone. Boiled and condensed Stevia liquid was found to find different applications than powder.

So, I launched a project to manufacture Stevia extract liquid from Stevia powder. After that, it was a series of challenges and failures. Though I tried the process of boiling, condensing, fermenting, and aging thousands of times in different methods, the extract liquid got rotten in a short period. I tried many kinds out of 154 kinds of Stevia and various combinations of these kinds to determine which one would exhibit the best effect.

With tests after tests for about 5 years, I finally discovered the method to manufacture Stevia Extract Liquid from carefully selected kinds of Stevia out of 154 by blending powder of stems and leaves at a specific ratio and by boiling the powder in natural water full of minerals and condensation, fermentation, and aging without any chemical extraction.

The Stevia Extract Liquid manufactured by this method for the first time in the world was dark brown liquid, 100% natural, and tasted a little sweet. Let me show you the difference between Stevia Extract Liquid and stevioside which is a sweetener called Stevia.

stevioside Stevia Extract Liquid

Material Stevia leaves only Mainly stems and partly leaves of Stevia

Ingredients Stevioside C₃₈H₆₀O₁₈ only Vitamins, minerals, and many other nutrients as shown in the following table

Appearance White powder Dark brown liquid

Manufacturers Many JBB Stevia Laboratory, Ltd. only in the world

General components in 100 ml of Stevia Extract Liquid

Energy 47 Kcal.

Water 84.2g

Protein 3.6g

Fat 0.4g

Carbohydrate 7.3g

Ash 4.5g

Ingredients in 100 ml of Stevia Extract Liquid

Calcium 120mg

Iron 1.3mg

Sodium 22mg

Potassium 2,200mg

Phosphor 200mg

Retinol 0

β-carotene 23μg

Vitamin A 13 IU

Vitamin B1 0

Vitamin B2 0.21mg

Vitamin C 0

Niacin 2.4mg

Arsenic Not detected

Heavy metals Less than 10 ppm

Since then, we have developed several different methods and know-how to manufacture several kinds of Stevia Extract Liquid according to the applications of the liquid based on selection of suitable kinds, blending ratios of stems and leaves, and the length of each process. We have got these new invented methods patented in many countries, and have applied for a number of peripheral patents on new discoveries and inventions resulting from our joint research and development with universities in Japan.

Joint research with national and public universities and the scientific results

For the past 7 years, we have been engaged in joint research with Tohoku University and Fukushima Medical College, and substantial scientific achievements have been made public in scientific congresses and magazines. They are pursuing further research from in vitro to in vivo experiment as well as identification of the effective ingredients and clarification of efficacy mechanisms. Here are some of the achievements.

1) Anti-oxidizing activity (Laboratory of Fishery Science, Faculty of Agriculture, Tohoku University)
Stevia stems have about 5 times more anti-oxidizing activity than green tea, and Stevia Extract Liquid has 8 kinds of effective ingredients to show much more anti-oxidizing activity. Four of them have been identified. It acts to inhibit excessive active oxygen in organisms, which causes various diseases and accelerates aging, as well as to repress.

2) Bactericidal activity against food-poisoning bacteria (Laboratory of Applied Microbiology, Tohoku University Graduate School of Agricultural Science)

In vitro experiment, Stevia Extract Liquid kills food-borne pathogenic bacteria such as E. Coli O157, salmonella, staphylococcus aureus, bacillus, yelnisia enterocolitica, and vibrio parahemolyticus, and does not kill useful bacteria such as bifidobacteria and lactic acid bacteria.

3) Activity to enhance the activity of useful microbes and the immunizing power of organisms (Laboratory of Animal Microbiology, Faculty of Agriculture, Tohoku University)

Stevia Extract Liquid multiplies useful microbes in the cattle rumen, which promote fermentation and digestion of eaten vegetable fibers, resulting in better appetite and faster growth. There were many cases where administration of Stevia Extract Liquid to undergrown or sick cattle and pigs increased their weight to the normal level or cured diseases.

4) Detoxifying activity against histamine (Laboratory of Fishery Science, Faculty of Agriculture, Tohoku University)

Histamine is a chemical substance existing widely in the tissues of animals. But excessive existence in a human body causes allergy, activates secretion of gastric acid (then causes gastric ulcers), and causes platelet aggregation and blood vessel contraction. Too much of it is known to stop growth of chickens and fish or sometimes to kill them. Stevia Extract Liquid was found to detoxify histamine.

5) Anti-HIV activity (Department of Microbiology, Fukushima Medical College)

In the 8th Anti-virus Chemical Therapy Research Congress held in May 1997, Prof. Yasuhide Iwata of Fukushima Medical College presented a paper on "Anti-HIV Activity of Stevia Extract Liquid" on an in vitro basis. Researchers all over the world are trying to discover anti-HIV substances out of more than 7,000 kinds of materials, but as of now no anti-HIV drugs without any side effects have been developed. In the International Conference on Antiviral Research held in San Diego, California, USA, in April 1998, further research achievements were presented by Dr. Kazuo Takahashi, Associate Professor of Fukushima Medical College, and attracted much attention.

In May 2000, we received from a director of the Uganda National Virus Research Center who saw the above paper a proposal of a joint research project on clinical examination of HIV-infected patients with Stevia Extract Liquid. The project is being prepared (details are explained in Chapter 6).

6) Activity to improve the side effects caused by anti-allergy drugs of steroid hormone (Aiwa Allergy Research Institute)

In 1993, Dr. Masako Motomura of the Aiwa Allergy Research Institute carried out a test on the 3 groups of rats bred by (1) normal feed only, (2) normal feed + Predonine (a steroid hormone drug), and (3) normal feed + Predonine + Stevia Extract Liquid. The result showed that Stevia Extract Liquid controlled the harm of the steroid hormone drug.

7) Activity to dissolve organophosphate agrochemicals, nicotine, and chlorine (Naito Environment Management, Ltd.)

a) A test was made by adding Stevia Extract Liquid to an organophosphate agrochemical "Malathion" to see how the residue content was reduced as time progressed. The result showed that the more Stevia Extract Liquid added and the longer the time, the less the residue content.

b) A test was made by adding Stevia Extract Liquid to nicotine-diluted pure water to measure the nicotine residue content. The result proved that it dissolved nicotine to an undetectable level.

c) A test was carried out by adding Stevia Extract Liquid to tap water, and the chlorine residue content was reduced to an undetectable level.

8) Activity to detoxify dioxins (Sumika Analysis Center Ltd.)

We requested Sumika Analysis Center Ltd. in 1998 to measure the density of dioxins contained in the garbage-burned ashes after addition of Stevia Extract Liquid to the ashes. Surprisingly, the toxicity of dioxins was reduced by 96%, and many newspapers reported this news.

Safety of Stevia proved

Even though Stevia Extract Liquid was 100% natural, it was most important to confirm its safety, so we requested various institutes to make safety tests on Stevia Extract Liquid.

1) Acute toxicity test (LD50) (Japan Food Sanitation Association Foundation)

Stevia Extract Liquid was administered through (via) mouth to each mouse at 1.0 ml/20g body weight for the group 1, at 0.75 ml/20g body weight for the group 2, and at 0.5 ml/20g body weight for the group

3. This administration volume of 1.0 ml corresponds to 3 liters drunk at a time by a 60-kg man. During observation of the rats for 7 days, no abnormalities were found, and all of them grew in a healthy condition. The result proved that LD50 of Stevia Extract Liquid was more than 50 ml/kg body weight, and it had very low acute toxicity.

2) Detection test on arsenic, lead, cadmium, tin, and pathogenic bacteria (Japan Food Sanitation Association Foundation)

Any of these substances and bacteria was not detected at the test made in 1991.

3) Patch test (The Association of Japan Hair Science)

In 1990, the fin chamber with Stevia Extract Liquid applied was kept pasted on the elbow skin of each examinee for 48 hours. Observation was made at 30 minutes and at 24 hours respectively after removal of the chamber, and the result was that only one out of 42 examinees showed slightly red spots, and in 7 days the spot disappeared.

4) General live bacteria culture test (Kitazato University Sanitation Science Center)

The general live bacteria culture test was made in 1991, and it was proved to be all negative.

5) Doping test

We requested the Laboratory of Racing Chemistry Foundation to make a test on Stevia Extract Liquid for detection of 48 kinds of prohibited drugs. It was administered to a racing horse before a race, and blood and urine taken after the race were tested. No drugs were detected.

Since Stevia Extract Liquid was released for healthy drink 10 years ago, we have not received any problems relating to its safety. As for stevioside as a natural sweetening alternative, some of the leading research institutes in the world presented scientific papers on chronic toxicity without any problem.

Chapter 2 In Pursuit for Promising Agriculture Prevailing Stevia Waves

2-1. The Stevia Agricultural Materials and their Effects

Revolution of farm produce by Stevia agricultural methods

Stevia agricultural materials were confirmed to activate the soil and to dissolve harmful chemicals in the soil. But their evaluation depends entirely on how much Stevia-cultivated products are welcomed by consumers. What effects will they produce on the products? With expectations and uneasiness, we asked farmers to try them.

The results were more than what we expected. The Stevia agricultural materials not only revived exhausted farmland but activated functions of organic manure, made plants healthier, and restored the good taste that agricultural products used to have originally.

(1) High quality and good taste

Believe it or not, Stevia-cultivated products were evaluated to be delicious and tasted like ones in the good old days. Especially, strawberries, cucumbers, and tomatoes had pleasing sweetness and natural tastes and flavors that we enjoyed several decades ago.

Spreading Stevia Powder over the land before planting and Stevia Liquid Extract over the plants multiplies useful microbes in the soil, promotes healthy growth of roots and plants, and activates photosynthesis, resulting in an increase of sugar content, vitamins and minerals which produce good tastes. Representative examples were an orange farm in Wakayama and a melon farm in Miyagi where higher-quality fruits were produced more than before, resulting in much more income. Many consumers who bought their fruits in supermarkets voiced, "Wow, this is really delicious."

(2) Increase of sugar content and vitamins

Stevia-cultivated fruits such as oranges, peaches, melons, and strawberries, when detected by a sugar content tester, showed 1~2 points up over non-Stevia-cultivated ones and a relatively uneven level of sugar content. This means Stevia-cultivated fruits restored the sugar content that they originally had when cultivated organically several decades ago.

Surprisingly, the oranges got uniformly colored even though they were hidden under their leaves without being exposed to sunshine. A melon with finer net patterns and thicker net lines is more valued in the market, and Stevia melons had such patterns.

Recently an expert, Sakura Hamazaki, in the Shizuoka Orange Experiment Station announced a research report that the sweeter the mandarin oranges, the more the substance “ β -cryptoxanthine” to suppress carcinogen contained. It is a pigment substance which was discovered in mandarin oranges by Masamitsu Yano, an engineer of the Orange Department of the Fruit Examination Station of the Ministry of Agriculture and Fishery. Though the mechanism of cancer suppression by this substance is not yet clarified, it was already confirmed that it suppressed cancer in animal examinations. According to Hamazaki’s examination, a mandarin orange with the sugar content 13 points contained 2 mg of β -cryptoxanthine per 100 grams, while ones with about 10 point sugar content had only 1~1.5 mg of the substance.

(3) Surprisingly long freshness

Stevia-cultivated mandarin oranges and the ones bought from a supermarket were kept in an office room for 2 months from January 6 through to March 5 for comparison in appearance. The latter showed white mold all over the surface, while the former showed no mold with the surface a little shrunk. Stevia-cultivated peaches put in a refrigerator on August 7 tasted very good on August 20 with little change in appearance.

Polished Stevia rice which had been kept in a box in a kitchen for 6 months had the same polish on the surface as 6 months before, and the cooked rice tasted the same. In 3 days after it was cooked and kept warm in a rice cooker, there was no discoloration or uncomfortable odor. Cooked rice cooled to room temperature for 1 day looked glossy and tasted good.

A Stevia-cultivated pear, which had been kept in a refrigerator since October, was found in April next year to have looked a little shrunk, but it was edible.

Long freshness means that fruits do not have to be harvested unripe, or they can be harvested ripe enough. It also means less damage of vegetables and fruits during transportation, storage, and sale in shops, resulting in more benefits for farmers, wholesalers and retailers.

(4) Full of vitality

A big typhoon hit the northern part of Japan on September 28, 1991, and gave tremendous damage to farm plants and fruits. There was no exception in Nakada Town where most of apples fell down. But not as many Stevia-cultivated apples fell down. On September 24, 1999, another big typhoon took a similar course, where in Takigawa Town more than 90% of apples in Koide’s apple orchard fell down, while 70% of the Stevia-cultivated apples on 3 test apple trees did not fall. This was aired via TV and attracted much attention.

We received a report that Stevia materials were applied to old trees which had not been bearing fruits in much smaller quantity than young trees, then they resumed to bear much more fruits.

(5) Much more income for farmers

The high quality of the Stevia-cultivated farm products coming from the long freshness, delicious taste with higher sugar content, and the safety free of agrochemicals, coupled with the harvest increase, produced a higher income for farmers well offsetting the cost of Stevia agricultural materials. Pear

orchard farmers were reported to have had an increase of more than 50% in 1999 over the last year. Generally speaking, Stevia-cultivated farm products are marketed at a 20% higher price in the vegetable and fruit markets than non-Stevia products.

(6) Highly effective against repeated cultivation troubles and diseases

Repeated cultivation troubles mean degradation of the soil caused by multiplication of specific harmful microbes in the soil and decrease of the other useful microbes due to repeated cultivation of a specific farm plant on the same land. To prevent these troubles, much disinfectant is applied on the land before planting. As a matter of course, useful microbes and earthworms are killed by the disinfectant, resulting in a vicious circle of soil degradation. In order to improve the degraded soil, earthworms are imported from America and put into the soil, or more organic soil has to be added to the land.

The disinfectant also multiplies and activates root knot nematodes, which cause the root knot nematode disease on Cruciferae farm plants such as Chinese cabbages and parsley.

Stevia agricultural materials, when applied to such degraded soil, activate and multiply useful microbes and earthworms uniformly, eliminating the repeated cultivation troubles as well as the need to use such sterilizer. When they are applied to the land before planting, they also accelerate germination of the spores of root knot nematodes before planting, and the grown spores cannot get on the planted farm plants, resulting in death. Nobuo Yoshida, an experienced parsley house farmer, reported on his first application of Stevia materials, "Generation of root knot nematode disease had been decreasing the harvest of parsley year by year. But after applying Stevia materials in my plastic houses, I had no such disease, and I could have more harvest of high-quality parsley."

Saburo Yano, a cucumber farmer in Miyagi Prefecture, sent me a letter to the effect that cucumbers had been suffering from nematode and blight diseases due to repeated cultivation, but in about a week after application of Stevia Extract Liquid over the plants, side branches started to grow and new buds started to come out. He was now confident of good harvest, and was more than happy not to use a disinfectant.

2-2. Many Testimonials and Examples on Stevia-cultivated Farm Plants

(1) Stevia makes rice tastier and stronger against abnormal weather

There is usually a pioneer in any new development. Mitsuo Chiba, a 68-year-old ex-manager and engineer of the Miyagi Agricultural Experiment Station was the pioneer for Stevia rice cultivation. His town Nakada-cho is famous for one of the most delicious rice in Japan with very fertile land, and used to supply its rice to the Imperial families.

Stevia agricultural materials drew his attention in 1990, and he thought by intuition, "This is just what I need." He lost no time to test cultivated tomato and cucumbers, and found they became resistant to diseases, and tasted much better.

Encouraged by this result, he started to apply Stevia to rice cultivation. In order to give advice to farmers, he himself had to try and get satisfactory results. He first tried Stevia in 20 are of his land with organic manure made of cattle and pig droppings and without agricultural chemicals. But he had much difficulty in getting rid of weeds in the first year. So, in the next year, he used a weed killer and fungicide to the minimum possible level, but did not use any insecticides. He spread 6 kgs of Stevia Powder per 1,000 m² just before plowing the land. Then he spread 1.2 liter of Stevia Extract Liquid per 1,000 m² of paddy field just before rice planting. In early September when ears of rice were about to get ripe and again about 10 days before the harvest, he spread the same volume of the liquid over the rice plants respectively.

Because he did not use any insecticides, locusts ate rice leaves and he harvested 480 kg of rice per 1,000 m², which was a little less than the conventional rice cultivation. What he was very pleased with was (the) much better taste of Stevia rice. He also got a very high evaluation from his neighbors who sampled

his Stevia rice cooked. Some of them reported to him that rice-allergy children ate the rice without any allergy symptoms coming out.

In the third year, he cultivated Stevia rice using some insecticides in a limited way. He also tried various methods (when, how much, how) of applying Stevia powder and liquid. He succeeded in harvest of the same quantity as the conventional rice cultivation.

In 1993, the coldest weather for the past 40 years hit the northern part of Japan, and all the farmers of the conventional rice cultivation had big damage equal to a 60~70% crop decrease compared with the average. But he suffered a decrease of only 30% with Stevia rice. He got firmly convinced that Stevia made rice plants much more resistant to abnormal weather.

After that, he became the preacher of Stevia agricultural methods, and started his enthusiastic activities to spread the Stevia methods around his area. Next year, several agricultural cooperative associations started to adopt the methods and to produce Stevia rice.

The rice in Hokkaido (the northernmost landmass of Japan) used to have much less market evaluation due to its poor taste. But Stevia rice was first cultivated here and got as high evaluation as the most delicious brands of rice in Japan.

(2) Stevia rice with surprisingly high evaluation

On December 6, 1999, the rice sampling party was held in Tokyo to compare the taste of various kinds of cooked rice including Stevia rice. The judges were journalists of newspapers and magazines. The 6 kinds of samples prepared were two brands of Stevia rice cultivated in Hokkaido and Fukushima Prefecture as well as those highest quality brands of "Sasanishiki" in Miyagi Prefecture, "Koshihikari" in Niigata and Ibaragi Prefectures, "Akitakomachi" in Akita Prefecture, and "Nihonbare" in Shiga Prefecture. They were cooked in the same kind of rice cooker in the same conditions. Each judge ate total 36 kinds of cooked rice as follows without knowing what brand he was eating:

- I. Hot and just from the oven
- II. Cooled and just from the oven
- III. Hot and kept for 6 hours in the oven after cooked
- IV. Cooled and kept for 6 hours in the oven after cooked
- V. Hot and kept for 24 hours in the oven after cooked
- VI. Cooled and kept for 24 hours in the oven after cooked

As expected, "Koshihikari" in Niigata won the first ranking of taste among 44 judges. But the two brands of Stevia rice got the 2nd and 3rd, which nobody had expected. Many judges made comments on Stevia rice beside its taste "rich in gluten," "slightly sweet," "glossy and tasty even after cooled and kept long." On top of crop increase per 1,000 m² and high market prices, Stevia rice was proved to be very attractive in taste to consumers.

As mentioned above, Stevia rice has another merit. It does not generate symptoms in people allergic to rice.

In order to prevent diseases, most of farmers put rice seeds in disinfectant solution, and spread agricultural chemicals over young rice plants before planting. Recent reports revealed that the rice plants with Stevia Extract Liquid used instead of such disinfectant and agricultural chemicals did not suffer from any diseases and showed a healthier growth.

(3) The highest market evaluation—Stevia pears

"Konno Pear Orchard" in Fukushima Prefecture has been producing pears for the past 100 years. Toshikatsu Konno told me, "We use Stevia for all our orchard of 16,000 m². We ship well-ripened pears of yellow color, while other orchards ship under-ripened pears of green color. Ours are of the highest quality in the market with very good taste and longer freshness." They ship their pears directly to the

Tokyo Tsukiji Vegetable and Fruit Market, and they are getting more orders than they can ship. “Our pears are the best with increased sweetness and longer freshness. You can instantly tell the difference in taste when you eat others and ours. Our trees are full of vitality and leaves grow thick.”

Hiroshi Fukazawa in Tochigi Prefecture has been cultivating pears in his 2.6 ha. orchard with organic manure and less agricultural chemicals. He started to use Stevia materials in May 1999 expecting the soil to be improved with Stevia. Supported by good weather, he harvested 40 tons per ha. “The average sugar content was as high as 13 degrees. This year we used much less agricultural chemicals than before, but we had no diseases with pear trees. What we felt in reaping pears was we needed more power to pick them off. So, we confirmed Stevia made the fruits more resistant to fall down.”

(4) The highest market evaluation—Stevia peaches

Hitoshi Kiyono in Fukushima Prefecture is the owner of Kiyono Orchard and the master of fruit cultivation in his district. “Stevia peaches are quite different from other ones in pleasant taste and flavor. The sugar content is 14.3 degrees average, about 2 points higher than the highest-ranking peaches. In not only sugar content but in appearance and size, Stevia peaches are the best. Thanks to longer freshness, we could ship well-ripened peaches. Of course, we can sell at much higher prices.” He used no herbicides and reduced other agricultural chemicals to half of what he had used before. In his orchard, one peach tree bears average 700 pieces, or sometimes as many as 900 pieces, while a standard peach tree bears 400 per tree.

Tatsuo Saito in Fukushima Prefecture started to use Stevia materials for 3,000 m² of his 1 ha. Orchard in 1996. Stevia Powder was mixed into the soil around each peach tree and Stevia Extract Liquid was spread over leaves in 700 times solution 3 times every 10 days before harvest. What he felt was different from before was more buds, thicker leaves, and better taste with more elegant flavor. From the next year he used Stevia all over his orchard. Peaches are generally more affected by weather. The year 1997 saw a much cooler weather, and all the orchards around him had big damage with many peaches falling down. But his peaches did not fall down at all.

(5) The highest market evaluation—Stevia melons

A 50-year-old melon cultivator Shuuichi Hino in Miyagi Prefecture was recommended by Mitsuo Chiba to use Stevia for his melon cultivation in 1993. “The sugar content is the very key factor in melon evaluation. As Mr. Chiba told me Stevia would surprisingly increase the sugar content, I lost no time to try Stevia. First of all, I put all the melon seedlings in a 500 times Stevia solution before planting. I was very surprised that all the 500 seedlings planted took root, because last year about 10% of the seedlings were dead or withered.” The sugar content in the first year was average 13%, about the same level as before. Most of other farmers might have given up the Stevia cultivation to see this result, because of little return on additional cost of Stevia materials and labor. But Shuuichi Hino did not give up and tried them in the 2nd and the 3rd years in spite of the extra cost. Finally in the 4th year, the goddess of victory smiled on him with delicious melons of 17% sugar content, a 4% increase over the ones of his conventional cultivation. Not only the sugar content increase but also good looking surface gloss, fine net patterns, and long freshness (the melon meat did not get softened in 3 weeks after well-ripened ones were cropped). The Hino melon has become so famous that every year he has not been able to meet increasing orders.

Takumi Baba in Fukushima Prefecture cultivates melons in plastic film houses. He mixed 5 kg of Stevia Powder with organic manure per 1,000 m² of land and spread the mixture over the soil before planting. After dipping melon seedlings in 1,000 times diluted Stevia solution, he planted them in late February. In late March and early April, he irrigated diluted Stevia solution on the ground around the plants. The

melon plants grew very well. As some red mites were generated, he applied acaricides once and fungicides 3 times only. He observed no other diseases and insects. He could confirm substantial reduction of agricultural chemicals.

(6) The highest market evaluation—Stevia water melons

A watermelon farmer in Kumamoto Prefecture was very proud of his watermelons as No. 1. He tried Stevia materials for a piece of land just for comparison. When he ate Stevia watermelon, he could not find any word to say, because even the meat very close to the skin was as sweet as the center meat.

(7) The highest market evaluation—Stevia mandarin oranges

Tanoura Town in Kumamoto Prefecture is famous for its production of mandarins with mild weather facing the Sea of Ariake. Masafumi Tanaka runs a 3 ha orange orchard. He uses Stevia materials, one ton of organic manure per 1,000 m² in spring, 30 kg each of chemical fertilizers per 1,000 m² in spring and fall, and agricultural chemicals spread over leaves a few times against longicorns and scales, which volume is about 1/6 of other fruit farmers. The sugar content tester shows 17~18% for Decopon oranges, 3~4% higher than non Stevia-cultivated ones, about 15% for mandarins and Pearl oranges, about 16% for Citrus natsudaidai, all a few % higher. "All kinds of our oranges are the best in taste, sweetness, and flavor," he said. He is shipping them to the Tokyo Tsukiji Vegetable and Fruit Market and Ohta Market in Tokyo at much higher prices.

A Decopon orange has a very thick peel and a very good taste and flavor. It is enjoying growing popularity especially among young ladies. The biggest problem with Decopon orange trees is that they start to bear fruit from the third year after planting, but from the next year most of the nutrition goes into the fruit and does not get into its roots well enough, so the roots and trees are getting weaker year by year resulting in less and less crop. In spite of all the research work to prevent this problem in the Citrus Experiment Stations, the only countermeasure available right now is to replant young trees every 7 years. Masafumi Tanaka applied 5~7 kg of Stevia Powder per 1,000 m² around Decopon trees, and spread 700 times diluted Stevia Extract Liquid over leaves 3 times at an interval of one week before harvest. After harvest, he checked up the conditions of the roots, and he was much surprised to find the roots grew and spread 10 times more than before. This was an epoch-making discovery, and the Citrus Experiment Station in Kumamoto Prefecture started to scientifically confirm this phenomena. Of course, the Decopon crop increased thanks to the healthy growth of the roots, and he has found no need to replant young trees.

(8) The highest market evaluation—Stevia strawberries

Niichi Enuma is cultivating strawberries in Ibaragi Prefecture, which is famous for its production of strawberries. He started to use Stevia materials in May 1998 with much less use of insecticides and fungicides. He could start to ship his strawberries about 20 days earlier than the previous year. And they were all of a large size with the sugar content 1~2% more and better taste and flavor. He found they did not change in taste and appearance after one month of storage in a refrigerator. He enjoyed more crops and much more income.

Yoshio Arai in Tochigi Prefecture runs a 0.6 ha strawberry farm, and began to use Stevia materials in April 1999. Due to too late application of Stevia materials, he did not find so much change in taste, but he saw little generation of anthracnose, yellows, and ticks in spite of reduced application of agricultural chemicals. "Any kinds of fungicides did not work against anthracnose due to repeated cultivation of strawberries on the same farm land, but Stevia is the exception. It has made the soil more flexible and easier for drainage. I was much surprised to see (much) more earthworms growing in the soil," he said.

In his second trial from October 1999, he applied Stevia Powder in plowing his field and spread Stevia Extract Liquid over strawberry leaves. He found a visible difference in root taking and plant growing. In early December, the color and gloss, the sweetness and size were quite different from the first trial.

(9) The highest market evaluation—other Stevia fruits

The Stevia agricultural method has been prevailing rapidly. Kazuo Baba in Okinawa Prefecture runs a pineapple orchard using Stevia materials. He used to have about 8% sugar content and had no choice but to eat pineapples of irregular size and shape, but in the first year it went up to 13%! And he could ship all of them to the market.

Jun Yoshida in Fukuoka Prefecture used to apply much agricultural chemicals to persimmon trees to prevent the black spot blotch disease. But since he started to use Stevia materials, he has reduced the chemicals to one-third and has never seen the disease. Of course the persimmon taste has been much improved.

Kazuma Kuroki in Miyazaki Prefecture did not like his grapes which were too sour, and wanted to increase the sugar content. After Stevia application, his grapes have become very delicious and sweet. Toshihiko Hidaka in Miyazaki Prefecture is using Stevia materials for watermelons to increase the sugar content. He used to have 9~11%, but now he enjoys a crop of water melons with 13% sugar content and uniformly large size. Before he could ship his products at only 500 yen per piece, but now his water melons are marketed at as high price as 1,500~2,000 yen.

(10) The highest market evaluation—tomatoes

Michio Tamori in Hokkaido cultivates about 8,000 tomato plants in PVC film houses. In 1998, he tried Stevia materials for 800 tomato plants in two PVC film houses. He felt some change in taste on the next day after Stevia Extract Liquid was sprinkled in 1,000 times dilution over the tomato leaves. The tomatoes cropped after 3 times of Stevia application over leaves were found tastier and their good taste lasted for about 3 weeks. In 1999, he applied Stevia materials for all of his tomato plants with organic manure only and without any agricultural chemicals. He thought organic manure might reduce the crop volume without any chemical fertilizer, but he had almost the same level of crop as in 1998. He found Stevia tomatoes were a little bit too sweet, so in 2000 he sprinkled more diluted Stevia solution over the leaves 7~10 days before harvest. As a result, he saw a sugar content increase ranging from 6% to 7~8% with a very good balance of sourness and sweetness. He also got the first class volume increase of 30% to 70%. He used to ship his tomatoes to the market at ¥700~800 per 4 kg case, but now his Stevia tomatoes are marketed at ¥1,100~1,200.

Kiyoshi Shiga quit his job working for a big optical firm and built a large farmhouse of 4,200 m² for water culture of tomatoes at a cost of 120 million yen with loans. But he faced unexpected difficulty of too much cultivating cost after he started the soil-less cultivation of tomatoes. He had to remove all the tomato plants once a year in July and to replant new tomato seedlings which cost him about 2.7 million yen. On top of that, his income was none during the replanting period and he had to pay for the replanting labor. One day he learned of Stevia materials and lost no time to implement the Stevia method. He cut tomato plant tops at 5 cm, dipped them in Stevia solution for half a day, and planted the cuttings. All of them took root and grew normally, resulting in the total saving of 2.7 million yen per year. The additional merits were that (1) he could grow the cuttings while mother tomato plants were bearing fruits, so he could continuously crop tomatoes all through the year, and (2) he could select the best plants to get the cuttings, which then produce the best-quality tomatoes and highest crop volume as the copies of the mother plants. As a result, he could increase production and get uniform, good-quality tomatoes at a less cost.

(11) The highest market evaluation—cucumbers

Tsuneo Ito in Gunma Prefecture started to adopt the organic cultivation for cucumbers in 1996 without any use of chemical fertilizers and agricultural chemicals. He runs 2,300 m² of plastic film house farm. He prepares farm soil with organic manure including 2% of Stevia Powder in weight. Then he sprays Stevia Extract Liquid in 700~1,000 times dilution over leaves 4 times at an interval of two weeks from when cucumber plants start to bear fruit to before harvest. The result of Stevia application was evident in the first year. "First of all, the taste has got much better. This is just what our consumers want. Then, we got much less disease in spite of no agricultural chemicals. This is the biggest merit for us. The harvest volume is 30% less than when we used chemical fertilizers, but we can sell at 30% higher prices. In total, our income remains the same but we can have additional merits of supplying delicious and chemical-free cucumbers," he said.

Takashi Yamada in Miyazaki Prefecture had been feeling deep chagrin at fewer crops of his cucumbers than other farmers. His strong desire to be No. 1 made him adopt the Stevia agricultural method. After one year, the result was (1) branch vines grew more and more buds came into flower, (2) cucumbers did not get tired of bearing fruit and plant branches were kept young for a longer time, (3) more flexible cucumbers, (4) crisper and tastier, (5) longer freshness and more uniform shape, and (6) the crop volume went up 3 times. His desire has come true.

(12) The highest market evaluation—Chinese cabbages

Yoshiaki Kanda in Saitama Prefecture who cultivates Chinese cabbages in 2,000m² of his plastic film house farm first tested Stevia materials in fall 1998 in one of the houses. He increased the crop by 10%. In 1999 he used them for all of his houses, and could reduce chemical fertilizers to half, and insecticides and fungicides substantially. Surprisingly, Chinese cabbages cultivated by other farmers started to turn yellow in a few days after harvest, but his ones remained fresh for one week. Evaluated in this long freshness, his products are traded at almost a double price in the market.

(13) The highest market evaluation—celery cabbages

A local newspaper "Kahoku Shinpou" reported that celery cabbages cultivated by Mitsuo Chiba with Stevia materials in Miyagi Prefecture were of slightly sweet taste, free of agricultural chemicals, with longer freshness, grew healthily without any clubroot and other diseases, and in great demand at a 10~15% higher price from supermarkets and pickle manufacturers.

Tadashi Yano in Ibaragi Prefecture tested Stevia materials for his celery cabbages in 1999. In a few days after he sprayed 1,000 times Stevia dilution over the leaves, he was surprised to see the green color of the leaves getting deeper and the leaves standing up. His second surprise was the slightly sweet taste without any bitterness when he ate a raw leaf. He did not expect such a remarkable effect from the first application of Stevia. He sprayed it 4 times in total at an interval of one week before harvest. His celery cabbages grew to a jumbo size of about 6 kg each with thicker leaves and yellowish core. His fertile farmland allowed him to get such a remarkable result in the first year. They were too large to be accepted within the standard size ranks in the market, and he had to find buyers for such big-size celery cabbages. He began to use Stevia materials for all of his celery cabbage fields in 2000 and started to try them on watermelons.

(14) The highest market evaluation—Stevia eggplants

Kunio Tosaka in Chiba Prefecture has been cultivating eggplants for the past 20 years. He first used Stevia materials as a test case in 2000. The plants took root very well and fruits grew faster. Various mites and diseases were not generated resulting in an 80% reduction of agricultural chemicals. Every year in the past, the crop decreased during the rainy season, but he could harvest the same quantity as in non-rainy season. This was his first experience since he started eggplant cultivation.

(15) The highest market evaluation—Stevia lettuce

A farmer in Tochigi Prefecture started to use Stevia materials in November 1999. He sprayed 700~1,000 times diluted Stevia solution over leaves 4 times at an interval of 7~10 days before harvest. Plants spread root more and leaves got more activated. He tore off leaves and let them stay on a table at a room temperature for several days. Torn edges of Stevia lettuce leaves got brown and melt much later than non-Stevia ones.

(16) The highest market evaluation—Stevia Japanese radishes (daikon)

A farmer in Saitama Prefecture started to test Stevia materials in 2000. He sprayed 5 kg of Stevia Powder per 1,000m² of land in mid-February, and diluted Stevia Extract Liquid twice over the leaves in mid-March and mid-April. Buds put forth faster and produced twice as much, and he could harvest one week earlier than on non-Stevia land. Stevia carrots were heavier in the same size and of much better quality. No diseases were found. He was much surprised at these results.

(17) The highest market evaluation—other Stevia vegetables

Ken Nomura in Ibaragi Prefecture cultivates small spring onions with the Stevia soil-less culture method. One of the leading supermarkets “Seiyu” purchases 80% of his products of good taste and long freshness.

Sweet corns on the cob cultivated by Hiroshi Iwakiri with the Stevia method have deeper yellow color and uniform size. The taste is better and you will feel thinner skins when you chew them. They are in great demand in the market.

Okras cultivated by Iwao Sano with the Stevia method have vivid green color and gloss with thicker furs. In the first year of Stevia application, he could crop okras 10 days longer in a 25% more quantity than the previous year. They stayed fresh longer. Thanks to these high quality features, he was requested by the market to put Stevia labels on his okra packages.

Usually rods used for growing shiitake mushrooms cannot be used in the fourth year due to aging. But in Oita Prefecture, after the fourth year rods were dipped in Stevia solution for 24 hours, they were used to grow shiitake mushrooms resulting in 80% of the crop on the third-year rods.

Matsuzaki Green Tea Farm in Fukuoka Prefecture tested Stevia materials for tea cultivation. The result was (1) reduction of agricultural chemicals to half, (2) better quality with outstanding color and gloss, (3) more crop by 15%, (4) higher market price by 15~20%, and (5) milder taste.

Houkoudo Green Tea Farm in Kyoto Prefecture first tested Stevia materials on 600 m² of land. In late February when tea tree roots started to get active, 3 kg of Stevia Powder was spread over the ground around the trees, and 200 liters of 700 times Stevia dilution was sprayed 3 times at an interval of one week before the first harvest in May, and the same quantity was sprayed again in the same way before the second harvest in July. They mainly used organic manure. In late April, there was a clear color difference observed from the distance between Stevia-applied tea trees and non-Stevia trees, the former being deeper in green color. They are going to analyze the ingredient contents for comparison of both kinds of tealeaves.

We should like to summarize the effects of Stevia application on farm products as follows:

- (1) Better taste
- (2) Longer freshness
- (3) Less generation of diseases and reduction of use of agricultural chemicals
- (4) Much less residual agricultural chemicals in harvested products
- (5) More harvest

(6) Can harvest earlier and longer

(7) More nutrition such as vitamins, minerals and microelements included in harvested products

(8) Original level of sugar content restored in fruits and vegetables

2-3. Frequently Asked Questions regarding the Stevia Agricultural Method

Q1. I used Stevia materials, but they did not work. Do they really take effect?

A1. Unfortunately, you cannot grow plants with Stevia materials only, because they are not fertilizers but plant activators and soil improvers. Please use organic manure together, if possible. Based on our long experience, better results can be obtained with organic manure more than 80% of the total fertilizer applied. Also, the minimum application of agricultural chemicals (insecticides, fungicides, and weedkillers) at the minimum possible level is recommended, though it is ideal not to use them at all. Stevia will dissolve the harmful chemicals spread over the plant leaves to an undetectable level.

Q2. Roots and leaves got better with Stevia materials, but I could not get good fruits. Why?

A2. We made the same mistakes before. We found it was caused by the wrong time and method of application. It is important to use proper materials in a proper time for taking root, growing stems and leaves, flowering, bearing fruits, or ripening fruits. For example, in a time for bearing fruits or ripening fruits, application of Stevia Powder or Liquid on the ground should be avoided because it will activate roots too much and the roots will take nutrition rather than fruits do. In this case, diluted Stevia Liquid should be sprayed over leaves to activate fruits.

Q3. When Stevia Liquid was sprayed over leaves, more insects get together. Why?

A3. There are some cases of this phenomena when 700~1,000 times dilution is sprayed. We have received many reports that spraying 300~400 times dilution prevented insects from getting together. We are investigating into why 300~400 times dilution worked well. If you applied 700~1,000 times dilution and got many insects on the plants, please use the minimum quantity of insecticides.

Q4. Do you have detailed application manuals for each farm plant?

A4. Yes, we do. But such manuals are not always applicable to every case because of difference in the soil quality, the kind and quantity of fertilizers and agricultural chemicals to be used, in-house culture or outdoor cultivation, weather, etc. We recommend you to study how to apply Stevia materials most effectively based on our manuals and find your own methods most suitable for you.

Q5. How long will it take to master the Stevia agricultural methods?

A5. Many enthusiastic farmers can master the standard methods in a year, and master their own suitable methods in the next year.

What I want to pursue with Stevia is "to restore the polluted and exhausted land to the land of 100 years ago," and "to solve the problems of the food safety and the food shortage in the world." The miraculous power of Stevia can revive the land exhausted by too much use of chemical fertilizers and agricultural chemicals, and activate the soil by multiplying useful microbes in the soil. Its chemical-dissolving power produces safe foods free of harmful agricultural chemicals. Its plant-activating power prevents plant diseases and promote healthy growth, resulting in an increase of harvest of high-quality foods.

Chapter 3 Increasing Application Possibilities in Stockbreeding, Fishery and Forestry Stevia promotes vitality.

3-1. Cattle, pigs, and chickens full of vitality

More appetite, faster growth, and more production

Stevia has many possibilities to play an important roll also in stockbreeding, fishery and forestry industries. Let us take a look at the stockbreeding field.

When Stevia materials are fed to farm animals such as cattle, pigs, and chickens in the form of feedstuff, drinking water, or direct administration, they get healthier, increase their appetite, and grow faster. Here are some examples.

(1) As cattle ruminates, the feedstuff cannot get digested well when its stomach is out of order, and gas tends to stay in its intestines. When gas stays in the intestines long, the color of the meat gets worse. So, to produce healthy color meat, gas should be removed by inserting a pipe into the stomach. Hikichi Ranch in Tochigi Prefecture made a test to administer 400 ml of Stevia Extract Liquid a few times to a cow, which had gas in its intestines. After administration, they found the gas disappeared.

(2) A veterinarian in Oita Prefecture fed 5 under grown cows (average weight of 539 kg) with 0.2% of Stevia Powder mixed with normal feedstuff for a month. In several days after the first day, they started to eat 10 kg of feedstuff a day, while they had been eating only 7 kg a day before. After one month, they gained 27.3 kg on an average from 539 kg to 566.3 kg, while 5 healthy cows without Stevia Powder administered gained 21.0 kg from 574 kg to 595 kg. The former showed a fine coat of fur and their meat was ranked fairly up above the middle in the market. This result was reported in the veterinary magazine "Ayumi" in March 1988.

(3) A calf tends to have diarrhea and sometimes pneumonia when it catches a cold. Hikichi Ranch in Tochigi Prefecture administered 300 ml of Stevia Extract Liquid mixed with milk to some calves, which had a cold and diarrhea.

(4) In 1991, 30 ml of Stevia Extract Liquid was mixed twice a day into drinking water to let 6 under grown baby pigs (average 7.15 kg on the 10th day after birth) drink for 63 days. After 63 days, they gained weight to average 34.17 kg, 0.5 kg heavier than 6 healthy pigs that were borne the same day and gained weight from 8.32 kg to 33.67 kg on an average without Stevia administration.

(5) A cattle breeder Minoru Akita in Miyazaki Prefecture breeds 350 beef cattle. He selected 6 cattle that were suffering from chronic coelenteron and had less weight than the average, and administered Stevia Extract Liquid to them until they were shipped to the market. The chronic coelenteron was cured and they gained weight to 816~850 kg, far heavier than the average weight of 720 kg. Their meat was ranked fairly up above the middle in the market.

(6) In Sugaya Pig Farm in Chiba Prefecture, 3 ml of Stevia Extract Liquid was administered to under grown baby pigs every day for a month after birth via its mouth by a nursing bottle. In one month, they recovered their weight to the same level as the healthy brother baby pigs. Stevia administration was continued till the day of shipment to the market, and Stevia-bred pigs were shipped one month earlier than the healthy brothers that were not fed with Stevia Extract Liquid.

(7) A poultry farm in Fukushima Prefecture added 1% of Stevia Powder to the feedstuff and 1% of Stevia Extract Liquid to drinking water for gamecock breeding. These Stevia feedstuff and water were fed to gamecocks for 100 days from birth until shipment. Surprisingly, they weighed an average 3.0 kg at the shipment, while average gamecocks without Stevia administration gained 1.5 kg in weight for 120 days until shipment.

At the 88th Congress of Japanese Society of Zootechnical Science in 1994, the Microbiological Laboratory of Tohoku University presented a paper titled "The Effect of Stevia on Bacteria in the Rumen of a Cow." The gastric juice of the rumen was put in bottles and 0.2% of Stevia Powder was added to some of the bottles. The bottles were kept at a temperature of 37°C for 24 hours, and the changes of various bacteria were observed for comparison between the Stevia bottles and the control bottles. The result of the biological and VFA analysis was that Stevia accelerated fermentation inside the rumen by multiplication of bacteria. This means Stevia increases animals' appetite.

Prevents and cures animal diseases

The ingredients abundantly contained in Stevia such as vitamins, minerals, and microelements together with its powerful anti-oxidizing power, detoxifying activity against histamine, and bactericidal activity against harmful bacteria work to prevent diseases, to increase appetite, to enhance the immunizing power and the resistance to harmful bacteria and virus. All these ingredients and activities produce a synergic effect to prevent and cure diseases. Here are some examples.

(1) In November 1991, a veterinarian in Oita Prefecture administered 100 ml of Stevia Extract Liquid twice a day for one week to each of the cattle that completely lost appetite due to hepatitis. On the 2nd day, they started to recover appetite. In one week, their appetite become normal, and GOT decreased from 256 to 69, and they had a normal bowel motion. This result was reported in the veterinary magazine "Ayumi" in March 1992.

(2) Also the magazine reported in December 1991 that the same veterinarian 30 ml of Stevia Extract Liquid twice a day for 10 days to each of the cattle that were suffering from gastroenteritis. The diarrhea was cured, and appetite returned to normal.

(3) In a farm in Miyagi Prefecture, a cow was losing appetite in the last month of pregnancy, and could not stand on its feet. The farmer fed it with crushed tomatoes amply mixed with 200 ml of Stevia Extract Liquid every day. In 5 days, it got better, stood on its feet, and recovered full appetite. It gave birth to a baby safely. The veterinarian was much surprised at the recovery.

(4) Usually 3% of milking cows suffer from mammitis. When they get the disease, they come to have stiffness in the udder and to run dry. To cure mammitis, antibiotics must be administered for about a month, during which milking is discontinued. In a farm in Tochigi Prefecture, a cow that was suffering from mammitis was administered 30 ml of Stevia Extract Liquid twice a day. In only 7 days, the mammitis was completely cured and it started to be milked normally again.

(5) There are many cases where mother pigs are more likely to have frequent diarrhea and run out of water in summer. So, they tend to take much more water. As a result, baby pigs suffer more from diarrhea, too, and sometimes they die. In Sugaya Pig Farm in Chiba Prefecture, they administered 3 ml of Stevia Extract Liquid every day to baby pigs without using any drugs or antibiotics. Ninety percent of the sick pigs got well.

(6) In Hikichi Ranch in Tochigi Prefecture, a bull suffered from urethra calculus and lost weight from 500 kg to 350 kg in 1998. There are no specific remedies available for this disease, and many of suffering cattle will die. They administered 500 ml of Stevia Extract Liquid to the bull together with a medicine 4

times. It got well and was shipped to the market half a year later than the average at 600 kg.

Enhances the immunizing power and reduces use of antibiotics substantially

We asked a leading veterinary specializing in salmonella treatment to test Stevia on calves of 50 kg each that had been administered salmonella bacteria via their mouths. Most of heavily salmonella-infected cattle die without any treatment. Three of them were then administered Stevia Extract Liquid, and the other three, antibiotics for recovery observation for 10 days. The 3 calves with antibiotics administered recovered relatively earlier, while one of the calves with Stevia administered got complicated by pneumonia and died, but two of them gradually recovered.

This result tells you that (1) Stevia Extract Liquid does not produce so quick an effect as antibiotics, but it does have a significant effect on heavy salmonella disease, (2) it will have a quicker effect on early salmonella disease, (3) it will not generate new harmful antibiotics-resistant bacteria, and (4) routine administration of Stevia to healthy cattle will prevent expansion of salmonella damage within the farm to the minimum level.

The feedstuff mixed with antibiotics is widely used for farm animals in Japan to prevent diseases, to accelerate growth, and to increase production. But antibiotics kill not only harmful bacteria but also useful ones.

Stevia materials selectively kill harmful bacteria and activate useful microbes in animal bodies. This unique function of Stevia Extract Liquid was proved by the scientific research carried out by the Faculty of Agriculture, Tohoku University, the paper of which was presented in the magazine "Microbiology and Immunology" Vol. 41. No. 12, 1997.

Though Stevia produces a slower effect than antibiotics against various food-poisoning bacteria, it does not generate any new antibiotics-resistant bacteria, and contributes towards production of safe meat.

A big surprise for enhancing fertilization

Stevia has proven to normalize the generative function of animals. Here are some examples.

(1) In December 1987, a veterinary in Oita selected 15 cows which did not show a symptom of sexual excitement for a long time after the last delivery, and examined them to confirm that none of them had corpus luteums nor ripe ovisacs. Just after the examination, Stevia Powder was added to feedstuff everyday by 30 grams each in the morning and in the evening per one cow. The test was continued for 40 days. The result revealed that 7 cows out of 15 showed the sexual excitement symptom and got fertilized within 20 days, and another 7 cows got fertilized within 50 days. This result was reported in the veterinary magazine "Ayumi" in March 1988.

(2) Referring to the above report, the veterinarian selected 8 cows that had a delivery on the same day. Four of them were fed with 60 grams of Stevia Powder every day mixed in the feedstuff, and the other 4 were fed with feedstuff without Stevia Powder. Blood was taken once every week for 4 times, and promptly separated from serum, which was kept under -20 C° . The measurement of β carotene was made by the high speed liquid chromatography method. β carotene concentration in the serum for the Stevia group cows showed significantly higher values ($200\sim 250\mu\text{g}/\text{dl}$) than that for the control group. Also the Stevia group got fertilized significantly sooner than the control group. According to Prof. Masanori Takeishi of Nippon University, the increase of β carotene concentration in the serum stimulates sexual excitement and promotes fertilization.

(3) The Dairy Experiment Station in Tochigi Prefecture presented a research paper in a congress in December 1997 regarding the effect of Stevia on the ovulation and embryos of cows. It is generally understood that getting as many embryos from embryo-supplying cows is important for successful transplantation of fertilized eggs. Referring to a recent report on the improvement of ovulation by Stevia

administration to cows, they made a test on 28 cows fed with and without Stevia Powder. The test proved that both the average number of ovulation eggs and that of normal embryos for the Stevia group were twice more than those for the control group.

(4) In Sugaya Pig Farm in Chiba Prefecture, 30 grams of Stevia Powder mixed in the feedstuff and 2% of Stevia Extract Liquid in drinking water were fed per pig in summer to prevent infertility. As a result, 80% of infertile mother pigs got sexually excited and pregnant.

(5) The pregnancy rate of pigs is usually 90%, but in summer when they get weary from the summer heat, it sometimes decreases to 60% because spermatozoa become inactive under the heat. Pig production decreases every year in summer in Japan and prices of pig meat rise highest toward autumn. Many pig farmers sprinkle water over pigs to increase the pregnancy rate without significant success. In Toyo Livestock Clinic, 15 grams of Stevia Powder per pig per day was mixed in the feedstuff everyday from July to September and fed to 10 pigs that did not get sexually excited for the past 4~6 months. Within two weeks after the start of the experiment, 4 pigs got excited.

Frankly speaking, I was much surprised at these reports on much improved fertility by Stevia materials.

Other interesting effects that Stevia materials have produced

(1) In September 1987, a veterinary in Oita wanted to see any difference in taste of cow's milk with Stevia materials. He fed 10 milking cows with the feedstuff with 0.2% of Stevia Powder mixed for one month. Many people around him compared the taste of Stevia-fed milk and regular milk. They did not find any difference in sweetness, but they commented on Stevia-fed milk as having much better body. As the result of ingredient analysis of the two kinds of milk, Stevia-fed milk showed a slight increase in milk fat content. This result was reported in a veterinary magazine "Ayumi" in March 1988.

(2) Quail eggs are evaluated in the market depending on patterns on their surfaces. The eggs of Stevia-bred quails have vivid and tasteful patterns.

(3) A veterinary in Kyoto Zoo reported to us that the flamingos fed with Stevia-mixed feedstuff had much more vivid pink feathers than regular ones.

(4) According to an article of Asahi Newspaper on January 4, 1995, there were 7.3 million pet dogs and 5.5 million pet cats in Japan. Many of the pets taken to animal hospitals are suffering from diseases such as diabetes due to too much nutrition just like human beings. Medical insurance is not available for pets, and it is a big headache for pet owners to pay much for pet treatment. We have been receiving good reports from users of Stevia materials for pets that (1) Stevia cured pet diabetes, (2) a pet dog suffering from cancer got well with Stevia, (3) a dog that lost its fur due to skin disease started to have fur coming out again, etc.

(5) Stevia materials have been attracting much attention in the horse racing industry. Here is a very famous remark Sir Winston Churchill made, "It is more difficult to become an owner of the champion horse in the Derby than to become the Prime Minister of the United Kingdom." There is no exception in Japan where it is also extremely difficult for a racing horse to be the champion in the Japan Derby from among about 15,000 racing horses. It is estimated that there are 90,000 horses being bred for racing in Japan. Although we know Stevia is 100% natural and safe for the health, we had to confirm the doping problem with racing horses. So, we requested the laboratory of the Racing Chemistry Foundation, Japan to test Stevia Extract Liquid on racing horses in September 1991. They performed the test based on Item (2) of Article 31 of the Horse Racing Law. They administered Stevia Extract Liquid to racing horses before a race, took blood and urine from the horses after the race, and analyzed the blood and urine to

detect 48 kinds of prohibited drugs. The result was all negative. Stevia materials are known to get rid of fatigue earlier after the race, to prevent diseases, and make horses healthier. There were several cases where Stevia-bred horses got the first prizes.

3-2. Meat quality and taste much improved with surprising ingredients added

Stevia pork is very delicious and makes brains work better

No consumers will pay attention to Stevia-bred meat unless its taste is much more delicious. Here is a good example of Stevia pork that has been much spotlighted recently. In September 1998, Tadashi Endo in Momou Town in Miyazaki Prefecture happened to know about Stevia materials from a feedstuff maker, "Kitanihon Kumiai Feedstuff Manufacturing Co." Although he was strongly recommended to use them because of the attractive features, he did not believe it. But later, he tried them on some pigs out of curiosity.

He selected the worst grown pigs, but they grew unexpectedly faster, and their meat was evaluated the best of all he shipped to the market. Encouraged by this result, he started to test on much larger scale. He found that (1) Stevia reduced the pig raising period by one month, (2) it increased the appetite very much, (3) pigs did not get weary under summer heat, and (4) the meat was very delicious. After one year in March 1999, he accomplished his objective to produce the best pig meat, which is now famous as "Momou Pork."

The features of Momou Pork are as follows:

- (1) The taste is far more delicious than others with juicy meat.
- (2) Soft and yet full of body in taste
- (3) Free of any animal odor
- (4) Stay fresh much longer, hard to get discolored
- (5) Meat juice does not drip nor come out
- (6) Meat looks beautifully pink

He sent his pork to the Foundation of Japan Food Analysis Center to analyze the ingredients, and to his big surprise, it contained 2 times as much calcium as a black pig which is said to contain much calcium, and DHA (Docosahexaenic Acid) which has never been detected in pig meat and is said to make the brain clear.

We requested the quality evaluation test on "Momou" pig meat to the Laboratory of Marine Biochemistry, Faculty of Agriculture, Tohoku University. The methods and results were as follows:

- (1) Blind comparison test on taste

The Stevia pork and the control pork were sliced 3 mm thick, roasted on a frying pan sprinkled with a little salt, and eaten by 10 members of the laboratory without letting them know the kinds of pork. Nine of them (90%) said the Stevia pork was tastier with their comments that it was softer, more juicy, and had much less animal odor.

- (2) Meat juice dripping

Both kinds of pork sliced 5 mm thick were put on a tilted white plastic tray with a cover closed, and kept still for 24 hours for observation of meat juice dripping. Much juice came out of the control meat, while no juice dripped out of the Stevia pork.

- (3) Odor

Both kinds of pork sliced 10 mm thick which were separately put on a tray were put into transparent plastic bags with 250 ml air filled and tightly sealed. They were kept at room temperature. Five ml of air inside was taken into an injector from each of the bags 4 times at an interval of 24 hours, and put into an odor sensor for measurement of odor density. On the 4th day, putrid smell was observed with both of them, but that of the control pork was much heavier.

(4) Pork color

The surface color of both kinds of pork sliced 5 mm thick was measured by a color difference detector 4 times at an interval of 24 hours. After one day, the reddish color of the control pork got darker, and the darkness was intensified much more day by day.

The Agricultural Cooperative Association in Momou Town started to market Stevia pork under the brand name of "Momou Pork" in the metropolitan area in January 2000 to provide this delicious pork to consumers in that district. The department store "Isetan" and the supermarket "Marui" have been selling this pork drawing strong popularity among consumers.

The Stevia pork production is gradually prevailing in other areas. Tsutomu Arai who runs a pigsty of 1,600 pigs started to try Stevia materials on 20 pigs in November 1999. To his surprise, the pig furs got more glossy, the pigs got very vigorous, and the pig bellies of well-grown pigs did not hang down. To prevent parasites, he used a parasiticide, but did not inject any drugs against influenza, swine-cholera, and swine epizootic pneumonia in cold and dry winter when such infectious diseases are more prevalent than in other seasons. He had the pigs grown healthy without any diseases throughout the winter. Usually, the growth of pigs is slower in mid-summer and mid-winter when it takes about 180~190 days to grow until shipment to the market. But his Stevia pigs needed only 145 days to be shipped to the market. The taste was excellent. Much encouraged by these results, he now plans to increase the number of breeding to 3,000 pigs.

Stevia produces an excellent effect on not only pigs but other farm animals. Shoichi Yoshida in Kumamoto prefecture put his Stevia-bred cows to an auction sale. The average market price was about ¥400,000 per head at that time. Buyers offered ¥700,000, but he did not accept it, then the price went up and up to as high as ¥1,000,000.

Stevia eggs have less cholesterol

Recommended by Kitanihon Kumiai Feedstuff Co., Ltd., a chicken farm in Miyagi Prefecture started an experimental use of Stevia Extract Liquid for 5,000 hens in July 1999. The liquid was put into a drinking water tank in a quantity of 50 ml per day. After 3 months, the farm staff tasted raw and cooked eggs, which were very good. The yolk color of the Stevia eggs looked deeper yellow or a little bit reddish than regular ones. They analyzed the ingredients and found the potassium content was over 2 times more than that of the regular ones, and cholesterol was decreased. The farm decided to market the Stevia eggs under a special brand.

3-3. Farm fish free of diseases and of delicious taste

Stevia materials keep fish healthy

Japanese fisheries are facing many problems with decreasing fish catch. So, farm fishery is becoming more and more important.

In farm fishing, antibiotics administration is also a problem as is the case with livestock breeding. Fish is more sensitive and more difficult to be bred than livestock. When a fish gets infected with a disease, the infection rapidly spreads all over the farm. So, most of fish farmers feed fish with antibiotics-mixed feedstuff. But antibiotics kill not only harmful bacteria and virus but also useful bacteria in the fish.

On the contrary, Stevia materials kill harmful bacteria and do not kill useful bacteria. Although they do not produce so fast an effect on diseases as antibiotics, but they do not generate new antibiotics-resistant bacteria. They provide safe, delicious fishes with longer freshness.

In 1998, most of the flatfish farms on the southern Pacific coasts had tremendous damage caused by an infectious virus disease, but the flatfish farm that was using Stevia materials had much less damage. A fish farm in Kagawa Prefecture carried out a test on 3,500 each of sea breams and flatfishes fed by the

feedstuff mixed with Stevia materials. The test was continued from June 1, 1998 through October 13, 1998, without any use of antibiotics. Stevia Extract Liquid was mixed into the regular feedstuff by 0.2%. After 45 days, the weight was measured with the result that Stevia-fed flatfish gained an average 100 grams, while the control fish gained only 20 grams. After 75 days, one each of sea bream was taken from the Stevia group and the control group, and sent to a famous Japanese restaurant for taste comparison after they were frozen alive. Appearance-wise, the length was the same, but the Stevia-bred one was higher and wider, and had a beautiful pink color, which remained the same pink as time progressed. But the control one had a blackish pink color and got more blackish after a lapse of time. When the Stevia-bred one was cut, the meat color was vividly and transparently pink, and the internal organs looked vivid and fresh in the same way as naturally grown ones. Especially the liver was very beautiful in color. The control one, which was bred with antibiotics-contained feedstuff, had the internal organs damaged and the liver looked yellowish. It was mysterious that the Stevia-bred sea bream did not generate much less smoke when roasted. When cooked in water, the hot water for the Stevia-bred one remained clear, while that for the control one looked a little cloudy. The last but not the least, the taste of the Stevia-bred sea bream meat was softer and much sweeter with less fat.

There were many reports on the excellent effects produced on fish by Stevia. Some of them are introduced here.

When our factory first started to manufacture Stevia Extract Liquid in Kagoshima Prefecture, many farmers around the factory came to complain about the factory wastewater, which run into a rivulet for agricultural irrigation. The factory manager took them to a small pond near the wastewater outlet, where many kinds of fish got together actively around the outlet.

An ayu fish angler sprayed Stevia Extract Liquid over a limpid rivulet where natural ayu fish was likely to get together, and immediately a lot of them rushed toward the place.

A goldfish lover in Saitama Prefecture saw a 3-year-old goldfish gasping and dying in a small water tank, so he put a bit of Stevia Extract Liquid into the tank. In 30 minutes, it began to swim actively.

Joint experiment with Shanghai Fishery University for reduction of the death rate of farm prawns

The farm breeding of prawns is very popular in China. The recent increase in water corruption and seawater temperature has been causing the spreading of harmful virus, resulting in a very high level of death for young prawns. An attempt to substantially reduce the death rate was launched as an experiment with use of Stevia Extract Liquid in China with our cooperation. The following was the report prepared on December 15, 1998, jointly by Shanghai Fishery University, Chinese Fishery Corporation, Chintao Fishery Products Corporation, and Chintao Farm Fishery Corporation.

The three groups of 120 prawns each with a length of 10~12 cm were prepared in three tanks in a room. The 1st group was fed with the feedstuff mixed with 1% of Stevia Extract Liquid, the 2nd group was fed with the feedstuff mixed with 0.2% of Stevia Extract Liquid, and the 3rd control group was fed with the feedstuff without Stevia. Every group was fed with the same quantity of each feedstuff at the same interval, and the water in each tank was kept at the same temperature between 17~21°C. The prawns in the 1st and 2nd groups were observed to eat the feedstuff more actively than the 3rd control group. The death rates of the 1st and 2nd groups were much lower.

The survival rates % for the 3 groups

The 1st group with 1% Stevia The 2nd group with 0.2% Stevia The control group

The 2nd day 97.5 96.0 92.3

The 3rd day 95.0 90.0 86.7

The 4th day 90.5 82.0 73.0

The 5th day 80.0 67.0 53.3

The 6th day 65.0 59.0 28.7

The 7th day 42.0 55.0 8.0

Another experiment was made with a different kind of prawns in the same way as above. The results were almost the same as the above.

A very significant difference between the Stevia groups and the control group was made evident for the two kinds of prawns by the above tests. Based on these results, a large-scale test will be carried out this year in an actual prawn farm.

3-4. Safe and good organic manure with Stevia

Anti-oxidization and detoxifying histamine

Fish powder is widely used for feedstuff for farm animals and fish as a source of protein. But histamine which checks the growth of animals is likely to be generated in the fish powder made of red meat fish, which is not so fresh. Too much histamine in animals causes allergy, enhances secretion of gastric acid abnormally to cause gastric ulcers and toxication, and produces adverse physiological effects such as platelet aggregate and blood vessel contraction. It may stop the growth of a chicken or fish, and sometimes kill them. There were big problems in the past where a lot of chickens or farm fish died of unknown causes, and a new type of virus was suspected to be the cause. When some of them were dissected, their mucosae were found to get sore or ulcers.

The Laboratory of Marine Biochemistry, Faculty of Agriculture, Tohoku University performed an experiment on rainbow trouts fed with the feedstuff containing fish oil. The fish oil is the easiest to get oxidized among all kinds of oil including animal oil and vegetable oil. The feedstuff containing oxidized fish oil and Stevia Extract Liquid and the feedstuff containing oxidized fish oil only was administered to the two groups of rainbow trouts. The Stevia group ate much of the feedstuff and showed much higher growth, while the control group did not eat so much. The results were presented in the congress of Japan Fishery Science. The details will be explained in Chapter 6.

The Fishery Business Center of Kyowa Fermentation Industry Ltd. is now developing a new feedstuff for farm fish jointly with us. The feedstuff mixed with Stevia materials that will promote growth of fish will be commercially available in near future.

Cattle dung is made into the best-quality manure

A manure-manufacturing center in Kumamoto Prefecture carried out a test to make organic manure from cattle dung with Stevia materials mixed in a very short period. Usually it takes about three years to make well-aged manure from cattle dung, because cattle dung has to be exposed to open air for a long time to get rid of salt contained in it.

Fifty kg of Stevia Powder was mixed into 20 tons of fresh cattle dung, and surprisingly in 24 hours the bad odor disappeared. In one week the temperature inside the cattle dung increased to as high as 80°C, and for two weeks the temperature was kept at the high level. It came down gradually to 40~50°C, and the manure was completed in one month. The analysis of the manure showed that the ingredients of nitrogen, phosphoric acid, and potassium were decreased, the other ingredients were at a proper level, and pH decreased. This analysis result represents a clear evidence that Stevia completed the fermentation in such a short time. It was also reported that this manure accelerated the growth of vegetables. Although further research and experiment are needed to have an ideal organic manure out of animal dung and raw kitchen garbage, this trial is epoch-making for solution of environmental problems arising from difficult-to-treat animal dung and raw garbage as well as for providing a lot of ideal organic manure.

3-5. Stevia promotes the growth of trees

An effect of Stevia materials on pine wood nematode

The pine tree withering caused by harmful insects such as pine wood nematode has been recently prevailing in Japan, and it is now very important and urgent to prevent and solve this issue.

The Ohita Forestry Experiment Station carried out a test on young Japanese black pines with various kinds of agricultural materials to compare their effects on prevention of pine wood nematode. The sample young trees used were Japanese black pines planted in the test yard of the Station with a height of 40 cm and a stem diameter of 1 cm. The materials used were:

- (1) Stevia Powder
- (2) White powder called "Karuchito" containing calcium carbonate, citric acid, and chitosan
- (3) The double quantity of "Karuchito"
- (4) White powder "Calgen" whose main content is calcium sulfate
- (5) GGF-A, a garlic extract liquid
- (6) White powder "Lysopin" which is extract from some plants

30 young pine trees were planted in each lot of land of 3.5 m². On June 13, the sample materials (1) (2) (3) (4) were spread over the ground of each lot, which was plowed after spreading, and the sample materials (5) and (6) were melted into water for spraying. 5,000 pine wood nematode strains were administered to each pine tree including the control group on August 30. Measurement of the trees in tree height and stem diameter at 5 cm from the ground was made on the planting day of June 13 and on the last day of November 7.

The observation on the last day was made based on the standards of (A) normal with all the needle leaves green, (B) half-withering with all the leaves above 1/3 height of the tree yellow brown, and (C) total-withering with all the leaves yellow brown. The result was as follows:

(1) The trees in all the lots applied by the sample materials showed a higher rate of the normal than the control trees. The trees applied "Karuchito" (2) and (3) had the highest, and the third highest lot was for the trees applied by Stevia Powder.

(2) The growth in tree height of the normal trees in the lots of (1) (2) (3) (4) was better than those in the control lot. It was the highest with the normal trees applied by Stevia Powder (1) and "Karuchito" double quantity (3).

(3) The growth of the stems of the normal trees applied by the sample materials was better than those of the control lot. The stem growth was the best with the Stevia Powder-applied normal trees.

The current countermeasure against the pine withering is mainly to spray agricultural chemicals, and there have been very few research reports on the prevention of the pine withering. Spraying agricultural chemicals may produce an environmental problem, and the above trial by natural materials may provide an earth-friendly approach to prevent the pine withering. The above test showed that Stevia Powder and "Karuchito" were the best among all the sample materials to solve and prevent the pine withering, and that Stevia Powder was the best to grow young pine trees. More frequent application of Stevia Powder might have produced better results.

We received a good report from Takashi Osaki in Chiba Prefecture, "When I poured diluted Stevia Extract Liquid to a potted old pine tree which was almost dying, it revived and is now in a good condition. Thank you very much for recommending Stevia for me." Another report came in that one of his friends was recommended to spray Stevia Extract Liquid over dying young pine trees with yellow brown leaves, and they revived green with Stevia.

As mentioned earlier, a kind of orange tree "Decopon" does not expand roots after 5 years of planting due to too much nutrition going into orange fruit, and starts to bear less fruits. Application of Stevia materials has improved the growth of the roots and helped bear fruits in normal quantity.

If further research against pine withering is positively conducted, an effective measure against it will be found available.

Chapter 4 For Selection of Healthy Food Materials No More Chemically Contaminated Foods

4-1. For improving the physical constitution by Stevia

No real good health without change of diet

Modern diet is full of risks. Vegetables and fruits covered by or containing agricultural chemicals, cattle, pigs, and chickens bred by the feedstuff containing antibiotics and growth-accelerating hormones, processed and precooked foods containing chemical additives, needless to say all of these are not good for the health. Consumers are afraid how much residue of these chemicals is contained in various foods on the stores shelves.

Vegetables used to feel delicious with natural flavor several decades ago. But vegetables and fruits cultivated with chemical fertilizers and agricultural chemicals do not taste good with much less content of nutrients. For example, the book "Standard Tables of Food Composition" published in 1963 read that vitamin C and calcium contained in 100 grams of spinach were 100 mg and 98 mg, while the new edition of the same book published in 1996 shows only 7 mg and 39 mg respectively.

We have to protect ourselves against invasion of harmful chemicals via foods. And one of the countermeasures can be to eat the Stevia-cultivated and Stevia-bred farm products, which are full of vitamins and minerals and free of agricultural chemicals, antibiotics, and growth-accelerating hormones.

Risks against health from the dining table

I should like to talk more about the risks against health that may arise from food materials being distributed in the market.

Imported agricultural products have a high possibility of containing agricultural chemical residue. There are some countries where agro-chemicals prohibited in Japan are still in use. Most spotlighted are the farm products from USA. In spite of the commitment made public by the US government to decrease the use of agrochemicals in 1993, a private organization EWG (Economy Work Group) reported that the total volume of agrochemicals used in USA increased by 10% since then, and that the content of carcinogenic agrochemicals in the foods for children increased two times.

The problems also come from the post-harvest application of fungicides and insecticides on farm products for export to extend the fresh period. Recently it became a problem that captan, a carcinogenic substance contained in a fungicide, was detected in some of the imported foods. There is a scientific report that, if men continue to eat vegetables till the age of 70 that contain the highest level of captan within the safety standard, 47 men out of 100,000 will have a high risk of cancer. Another example was that importation of cherries was once banned due to the detection of an injurious insect called "Codoringa," and only fumigated ones have been allowed for importation. But this fumigation is dangerous because cherries have to be exposed to volatile containing an insecticide of methyl bromide at 20 °C for two hours, which is a substance to cause cancer or baby deformation.

The recent statistics show that the self-sufficiency rate in Japan for fresh vegetables used to keep 99% till 1975, but it decreased to 85% in 1995. The background for this rapid increase of imported vegetables is the very competitive cost pursued by big supermarkets and restaurant chains. This approach for the cost only without any safety consideration must be reconsidered.

The second biggest risk is now in the spotlight, namely the GM foods (Genetically Modified foods), which EU is against. "The Organic Foods Production Act" that US Department of Agriculture announced in 1997 included GM foods in the organic foods. With a rush of protests against this act from all over the world, the department excluded GM foods, and decided in early 2000 to prohibit indication of "organic" on GM farm products.

Genetic modification means replacement of some of genes in a farm plant by a gene, which produces an

injurious insect killing protein, or a gene, which produces an ingredient with strong resistance against herbicides. It allows production of corns which are resistant to injurious insects or soybeans which are resistant to herbicides.

In Japan 29 kinds of GM farm products have been approved, and they are used for processed foods such as soy sauce, tofu (bean curd), salad oil, miso, corn tips as well as feedstuff for livestock. Japan is the world's biggest importer of GM farm products. For example, 98% of soybeans consumption is imported, and 80% of imported soybeans come from USA with nearly 40% of US origin being GM beans.

GM farm products are resistant against injurious insects or weather change, reduce labor cost, and increase production. But their safety has not yet been scientifically confirmed. Here are some examples reporting their bad effects on ecology. The rats that ate GM potatoes showed decreases in growth and immunizing power. A research group in New York University presented a paper in the scientific magazine "Nature" that a harmful ingredient that kills injurious insects permeated into the soil from the roots of GM corn plants, and the ingredient stayed for more than 200 days in the soil keeping its anti-insect activity without being dissolved by microbes.

Safety-sensitive EU has banned genetic modification, cultivation of GM farm plants, sale of imported GM foods in supermarkets. GM farm product producers claim that GM farm plants kill injurious insects only, and they are not harmful to the human body. But the substance that kills insects cannot be safe for men who take it in. We must pursue safe foods by ourselves.

Imported meat is a little dangerous

Meat is an indispensable food as a direct supply source of protein. Even if we hear the meat is full of antibiotics, we cannot live without it since only such meat is available in the market. But do we have to give up?

Antibiotics have been saving our lives as a magic medicine since the development of penicillin. They have also been "the Savior" for farm breeders, because they accelerate growth and prevent diseases. But too much use of them for farm animals may produce a harmful effect on the human body. Men who eat meat with antibiotics residue may have diarrhea, headache, or sickly feeling. Too much accumulation of antibiotics in the human body may generate new antibiotics-resistant bacteria, which check the effect of antibiotics administered to a sick patient.

The same case happened with farm animals. A representative example was the super antibiotics-resistant bacteria VRE (Vancomycin-Resistant Enterococcus). This bacterium has acquired the power to resist the attack of Vancomycin, which is the latest and most powerful antibiotic available now. When VRE get into patients via meat that they eat, even Vancomycin is not effective against VRE, which kill about 70% of the patients.

Much of imported meat has antibiotics residue. There are about 30 kinds of antibiotics approved by the US Food & Drug Administration (FDA) for farm animals, such as penicillin, streptomycin, etc. In USA, 70% of farm animals are being administered with these antibiotics, and the FDA is warning that antibiotics-resistant bacteria are increasing. In USA, DT-104 type salmonella and campylobacter were detected in beef. In UK, cattle were found to be infected with mad cow disease and millions of infected cattle were killed and disposed.

In a Denmark hospital, VRE were detected in some patients who had never been administered with Vancomycin. The research group traced the sources and found that the patients ate the meat of the chickens bred with an antibiotic called Abopalcyn which has a very similar molecular formula to Vancomycin. After that, the use of Abopalcyn was banned in Denmark and Germany, and also in Japan in 1997. In January 1998, VRE was detected in the chicken meat imported from Vietnam, and the Ministry of Health and Welfare temporarily banned importation of Vietnamese chicken meat. After that, VRE were again detected in the chicken meat imported from Thailand. This means there are still many countries where Abopalcyn is used for farm animals. The inspection carried out by the Ministry of

Agriculture in Japan on cattle dung in 107 breeding farms revealed that VRE were detected in 3 farms. It is easy to say that use of such risky antibiotics should be prohibited, but practically it isn't. Discontinuing the use of antibiotics increases farm animal diseases and reduces their production resulting in a sharp increase in meat and egg price. Antibiotics, when administered to chickens, kill bacteria in their intestines and have protein absorbed more and faster. As a result, chickens can be shipped to the market two months earlier. So, antibiotics are very effective means for substantially enhancing the productivity. Farmers cannot do business without them. Of course in Japan, the Drugs, Cosmetics and Medical Instruments Act severely restricts the use of antibiotics for farm animals for a specified period before slaughter.

But for imported meat, the Act cannot be applied in foreign countries where the restrictions are different in each country. In September 1999, an antibiotic "oxytetracyclin" was detected in the prawns imported from India at a level 5 times more than regulated in the Act.

Life is dear to everybody, but we want to eat meat. Is there any solution to this dilemma? Yes. To mix Stevia Powder into the feedstuff is the answer. Stevia can be a very good, natural substitute for antibiotics, or greatly reduce the use of antibiotics. On top of that, it can produce very delicious meat, which stays fresh for a longer time.

4-2. Very high evaluation on Stevia farm products in the market

I have been stressing in the above chapters that we should try our best to eat Stevia farm products to protect our health. Now I want to introduce to you how Stevia farm products are being distributed and evaluated in the market.

Stevia-cultivated rice

Safe and delicious Stevia rice free of agrochemical residue is drawing attention in the market and among consumers. A large-scale cultivation of Stevia rice has been launched by one of the leading rice wholesalers "Shinmei Co., Ltd." which has many sales branches, rice-cleaning mills, and logistics and warehouse centers in the major cities throughout Japan. A manager of Shinmei Co. commented, "Most brands of current rice plants are weak in resistance to diseases, and have to be cultivated for healthy and productive growth with agro-chemicals and chemical fertilizers. This, I think, has caused current rice to lose the original good taste and flavor. If this kind of cultivation method is continued, I have been afraid that Japanese rice will have less and less good taste and flavor. I have been looking for any natural materials that can replace agrochemicals and chemical fertilizers. Now I have come to know Stevia materials. At first I tasted Stevia rice cultivated in Hokkaido where there were not any brands of delicious rice. To my big surprise, a very good smell came out of the oven and spread in the room. I have never had this kind of smell except for the top-ranking brand rice. It tasted very delicious, and I could not believe this was really the rice from Hokkaido. My second surprise was the appearance of the rice in the oven when I saw it after it was cooked and kept warm in a rice cooker for 3 days. It looked glossy, not discolored yellowish, and tasted almost as good as just from the oven. I lost no time to contact JBB Stevia Laboratory and got much information on Stevia materials. We experimentally used them on rice cultivation in the season of 1998. We learned that Stevia materials had a disinfecting activity, so we reduced much of agrochemicals for this test. Again I was much surprised that Stevia-applied rice plants did not suffer from any diseases, and grew very active and healthy. In 1999, we applied Stevia materials on much more area of rice paddy field for a larger-scale test, and after the harvest, we had a rice sampling party as mentioned in Chapter 2-2. We are afraid consumers eat less and less rice. We are very confident that Stevia rice will help recover rice consumption with its safety and delicious taste. We will

proceed very positively with Stevia rice production and distribution throughout Japan.” The Shinmei and Suhawara group will have 6,000 tons of rice cultivated by farmers on a contract basis in 2000.

Stevia pork with safety and good taste

As mentioned in Chapter 3-2, Stevia pork with the brand name of “Momou Pork” is evaluated the highest in the market as follows:

It started to be sold at the main store and the Urawa store of Isetan Department Store in January 2000. It gradually attracted consumers’ attention, and in April Momou Pork sales expanded 3 times with repeat purchasers. Now it is selling best among any kinds of pork, and its high quality brand name has been established. A purchasing manager of Isetan said, “We will start selling this pork in every branch store throughout Japan.”

Ito Ham Co., Ltd., one of the leading ham makers in Japan, has decided to market Stevia pork ham as a high quality brand.

Fruit and vegetable markets in Tokyo are much interested in Stevia-cultivated farm products

Tsukiji Fruit and Vegetable Market in Tokyo, which is the most famous in Japan for metropolitan distributors and consumers, is always very active with auction at around 2 o’clock in the morning. Many brokers in the market commented, “Stevia tomatoes are always 20% higher in price, and the taste is delicious, sweet, and really different.” Peaches, pears, Chinese cabbages, etc. cultivated by Stevia materials are also sold out first.

Director and General Manager of Tokyo Tsukiji Fruit & Vegetable Co., Ltd. said, “Stevia farm products are receiving very good attention among brokers. Regrettably the incoming volume is still not so big. We are trying our best to collect Stevia farm products from all over Japan.” When they started to handle Stevia farm products, they opened a customer service center in the market, which gives a quick response to phone inquiries from consumers and distributors regarding how long Stevia farm products are kept fresh, residues of agrochemicals, how much chemical fertilizer is applied, and so on.

It is worthy of special mention that Stevia farm products have gained such high evaluation not only in the Tokyo Tsukiji Market but in other metropolitan markets at Ohta, Adachi, Toshima, Senju, and Kanda. Especially in the Kanda Market where its annual trading amount is less than other markets, they give top priority to dealing in Stevia farm products because they want to catch up with the other markets with differentiated products having attractive features such as Stevia farm products. This Stevia trading trend is spreading to local markets.

New challenges with Stevia farm products in retail markets

Then, what about retail markets? First of all, the sales areas of fruits and vegetables in supermarkets are undergoing a new change. In the past, almost the same kinds of fruits and vegetables were displayed in every supermarket. For example, cucumbers were almost the same in length and thickness, and available any time throughout the year. But now, organic farm products with different size and look are on the shelves with posters explaining how organic they are and who are their cultivators. Consumers have come to buy safe products even at a higher price regardless of size and shape.

Many supermarkets and department stores have started to sell Stevia-cultivated farm products with posters explaining about the safety free of agrochemicals, long freshness, and of course much better taste and flavor. The number of handling items is also increasing. Some of them have opened a Stevia corner where only the Stevia products are displayed. One department store has started to sell Stevia rice in a TV shopping program, which used to sell high-quality items such as garments and jewels. “Consumers are getting more interested in the safety of foods, and we want to let them know Stevia can provide it,” the

department's manager said.

From June 22 to 28, 2000, a joint sales event by Tokyuu Department Store and Tokyo Tsukiji Fruit & Vegetable Co., Ltd. was held in the department store with Stevia farm products, such as watermelons, cherries, melons, tomatoes, cucumbers, spinaches, daikons (Japanese radishes), etc. They provided a sampling party for visitors to eat them raw. Every visitor who ate them unanimously praised, "It's a really long time since I had such a delicious fruit last." And "It's indeed a taste of the good old days." As the event went on, the event center was overflowing with more and more people, and the Stevia products were selling like hot cakes. Toward the end of the event, some of them run out of stock. Daisho, one of the leading dining and drinking saloon chains, has more than 400 saloons throughout Japan. They started to use Stevia farm products for their menu dishes in one of the saloons in Tokyo with the posters pasted on the walls explaining about Stevia food materials. Reaction from the customers is pretty good, and they want to do the same in many other saloons. The branch manager said, "When I first took a bite of raw Stevia carrot, it tasted quite different from what I have been eating out of a supermarket. I thought this was the real stuff. Maybe the carrots of several decades ago might have tasted the same. So, I made a proposal to use Stevia products such as meat, rice, and vegetables. The key words were "Safety, Healthy, Fresh, and Hand-made." The top management accepted my proposal, and we have been using Stevia products only for all the dishes except fish." President Taira of Daisho Restaurant Chain said, "Nearly 40% of Japanese are eating out. This figure is surprisingly high. So, we are very responsible to provide our customers with healthy and high-quality foods as our policy. Stevia products have allowed us to exactly meet our policy."

Processed foods lineup with Stevia Extract Liquid added

Here are some examples of Stevia-added processed foods.

★ Stevia cake and pie at Kokaji Confectionary in Tokyo

A long-established confectionary, Kokaji, was the world's first to use Stevia Extract Liquid for cooking cake without any use of antiseptics and additives. Their brands are "Stevia Cake" and "Stevia Stick pie." They are not only delicious but good for the health, and especially recommended for people with atopy dermatitis and high sugar content as well as people on diet.

★ Stevia noodle at the Nakada Branch of the Tome Agricultural Cooperative Association in Miyagi

The dried noodles with Stevia Extract Liquid mixed are tasty and selling very well for gifts.

★ Stevia tofu (bean curd) at Sato Tofu Store in Fukushima Prefecture

Stevia tofu features a round shape, bamboo basket patterns on the surface, and long fresh life. It is made of the highest-quality pure Japanese soybeans cultivated organically without any agro-chemicals. It is really delicious.

★ Stevia bread at Kazamidori Bakery in Urawa City, Saitama Prefecture

The bread hand-made here is very famous for its excellent taste. The owner of the bakery is always enthusiastic about new trials and study for good taste. There are many fans for his bread coming to his shop by bus or train. He happened to know Stevia because his daughter was suffering from atopy dermatitis and he tried Stevia Extract Liquid and Cream on her. I recommended him to bake bread with the liquid a little bit mixed. With a slightly sweet taste and good flavor, the Stevia bread is attracting much attention from his customers.

Agricultural business prevailing

Many big companies, which have not been engaged in agriculture before, have entered the agricultural business through cultivation, processing, distribution, and even restaurant business. Here are some examples.

Omron, an electronic device maker, started to cultivate tomatoes in glasshouses in Hokkaido in 1999.

They built a big glasshouse of 70,000 m² allowing 4 crops a year.

Kewpie Mayonnaise Co., Ltd. started to run a computer-controlled vegetable production factory in 1998 in Fukushima Prefecture. The artificial light is used instead of the sunlight, and vegetables are completely under the water and sterile culture without any agrochemicals for shipment in packages without washing crops to the market. They are very proud of a very low level of bacteria in the packages, namely 1/100th of regular vegetables.

Utilizing biotechnology, Mitsui Chemical Co., Ltd. is developing hybrid rice. Secom, a building security system company, is also developing a computer-controlled factory to cultivate herbs.

But, can these highly advanced culture methods produce such farm products as to have a high content of vitamins and minerals and to have long freshness? Stevia may be a solution for them.

Chapter 5 Let's Bring Our Towns and Villages Back to Life again with Stevia

Utilization of Stevia is a profitable investment

5-1. For the cycling agriculture business with all the members involved

Establishment of new agricultural corporations with Stevia

We have recently been receiving inquiries from some municipal corporations about Stevia projects. One of our business philosophies is "Let's bring our towns and villages back to life again with Stevia." Stevia can be cultivated with ease on any kind of soil anywhere in Japan from the northern part of Hokkaido to Okinawa. It does not require agrochemicals and not so much fertilizers and labor. Our objective is to establish a Stevia business center in each prefecture where the total system ranging from Stevia cultivation to the production and sale of Stevia materials is implemented. Its applications are very wide, covering agriculture, stockbreeding, farm fishery, forestry, gardening, pet animals, processed food, health drink, cosmetics, medicine, and chemical industry. With all the people around the center participating, Stevia will provide new employment and income, and activate the local industry and economy. The increased income of the people and corporations there will increase tax revenue of municipal governments. The consumers will become happy with Stevia farm products which are delicious, safe, free of agrochemicals, and full of nutrients. The farmers will also become happy with the improved quality of the soil that has been exhausted by too much use of agrochemicals and chemical fertilizers. This is exactly the total business system that has many possibilities to expand in many fields.

Active challenges have already been started in many places

Here are some examples.

(1) Town of Nakasato, Aomori Prefecture

A joint venture is planned to be established by the town and the agricultural cooperative association. According to their plan, they want to have Stevia cultivated, to build a factory to make Stevia powder and extract liquid for sale to farmers throughout the prefecture, and to cultivate and sell Stevia farm products in the prefecture and to the markets in Tokyo. The test cultivation of Stevia as well as several vegetables and rice already started in the spring of 2000. The town officers have visited the markets in Tokyo where Stevia-cultivated farm products are being traded, and also some successful joint ventures of the same kind. They plan to utilize the heat generated by the town-owned garbage incinerator for manufacturing Stevia Powder and Extract Liquid. One of the town officers said, "Application of Stevia on rice cultivation only will not activate our whole town. We will have many kinds of vegetables cultivated with Stevia materials by as many farmers as possible participating. The factory will also create new jobs in manufacturing and product marketing. With increased tax revenue, we want to reduce the

residential tax and to provide more care for the aged. This will stimulate more young people to settle down in our town and prevent the depopulation problem that has been our big headache.”

It was just a phone call from a resident in Los Angeles who was from the town that the town mayor came to know Stevia. One day he watched a TV program for Japanese residents by chance. It was a rebroadcast of “Zoom-in Morning” aired by Nippon TV on September 9, 1999, in Japan about Stevia-cultivated vegetable and fruits actively marketed at higher prices in the Tsukiji Fruit and Vegetable Market in Tokyo. He learned Stevia farm products were far more delicious and safe, and kept fresh longer.

As the mayor intends to implement this Stevia project within the coming 3 years, we will support him with all our resources.

Another example is the village in Miyakojima Island in Okinawa Prefecture. The municipal village office is very positively encouraging the Stevia agricultural method in the whole island.

Agricultural cooperative associations JA have also started Stevia projects

JA Okabe in Saitama Prefecture is famous for the biggest supplier of broccoli in Japan. It has used the Stevia method for cultivating broccoli and tomatoes.

JA Niiharu in Ibaragi Prefecture is famous for the biggest supplier of pears in Japan, and has been using Stevia materials for pear culture. Many buyers are demanding more Stevia pears, and young farmers have become more active with the Stevia method.

A “Crown Label” which shows Stevia-cultivated farm products is pasted on each piece of tomato at JA Mutumi, and \10,000,000 was invested on new carton boxes to clearly indicate “Mutumi Tomatos” are cultivated by the Stevia method.

5-2. Stevia business in overseas countries

For solution of the problems of increasing population, food shortage, and environment

The world is facing serious problems of increasing population, food shortage and environment. The population in developing countries is greatly increasing, and the world’s current population of 5.2 billion will reach 120 billion toward the end of the 21st century according to most of forecasts. It is evident that the food shortage will become more and more serious.

We believe Stevia will solve these problems by increasing production of farm products and activating the local industry and economy, because Stevia is finding a very wide range of applications in agriculture, stock raising, farm fishery, forestry, health food and drink, cosmetics, medicine, and chemical industry. The economic value to be generated and added to towns and villages by Stevia business will be extensive and tremendous including the creation of new jobs.

Many overseas countries know Stevia’s mysterious power. We wish to promote Stevia projects in developing countries under ODA (Official Development Assistance) programs by JICA (Japan International Cooperation Agency). Here are some examples of Stevia projects in foreign countries.

(1) China

As mentioned in Chapter 3-3, the joint project with Shanghai Fishery University to prevent the virus damage to prawn breeding is under application for NGO assistance funds of 10 million yen to the Ministry of Foreign Affairs in Japan. If this project is successful, the same kinds of projects can be launched in other Asian countries as well as all over China.

In Da Lian in the northeastern part of China, experimental rice culture to the amount of 300 tons by the Stevia method is planned for April-October 2000. Stevia materials have already been shipped to China.

In Yang Zhou in the northeastern part of China, a project to cultivate 10 kinds of farm products by Stevia materials is under way together with the municipal government of Yang Zhou with the "Grass Roots Fund" of 10 million yen to be provided by the Ministry of Foreign Affairs in Japan.

(2) Sri Lanka

A Stevia project was initiated when I met Mr. Navin, the Director of the South Area Development Agency during my first visit to Sri Lanka 3 years ago. In February 2000, Mr. Patelana who works for the Japan International Youth Training Center introduced me in Tokyo to Mr. Amarasiri Donangoda, Minister of Vocational Training & Rural Industries, during his visit to Japan. The project was revived by his keen interest generated by our detailed explanation about Stevia Power and the project plan. The plan that we are now promoting is as follows:

- ① Stevia plants are cultivated.
- ② Stevia Powder and Extract Liquid are produced.
- ③ Various farm plants are experimentally cultivated by Stevia materials, and when successful, they are cultivated on a large scale.
- ④ Breeding of cattle, pig, and chicken is also planned.

Sri Lanka's unemployment rate is 80%, and the main industries are tea, jewel stones, and working overseas. The Stevia project will help increase employment. Currently Japan's ODA to Sri Lanka has been about 40 million yen per year, and we are preparing for application to JICA for some funds under ODA programs on this Stevia project. ODA has been mainly covering projects of construction of "hardware" such as schools, roads, bridges, power plants, etc. but ODA for Stevia projects will cover "software" of the business system that will continue to activate the Sri Lanka economy utilizing self-supplied resources such as labor, land, materials locally available. Also the results are friendly to environment, increased production of safe foods, health improvement with reduced health care expenses, and generation of increased employment.

(3) Taiwan

Stevia materials have been used for cultivating oolong tea since 1989 in Nanto Prefecture. The leaves of Stevia-cultivated oolong tea are larger in size, of higher gloss, and softer and easier to be picked off. According to the Mayor, the crop has been 20% higher, and the oolong tea has won many prizes in the Taiwan Tea Exhibition contests.

Based on this good result, Stevia materials are being applied to rice, grapes, tomatoes, etc. Taiwanese grapes are sour and less sweet with thicker skins, but Stevia will improve the quality.

(4) Philippines

A test cultivation of mango was carried out with Stevia materials. The results surprised the mango farm owner, and he intends to use them in much larger scale. According to him, Stevia mango stayed fresh longer with a few % sugar content increase and better taste. Stevia prevented mango diseases such as anthracnose and black spots.

(5) Uganda

According to the Joint Clinical Research Center in Kampala, about 10% of Uganda's population is HIV-infected. A director of JCRC happened to know the scientific paper presented to the 11th International Conference on Antiviral Research in San Diego, California, USA, in April 1998 by Dr. Kazuo Takahashi of Fukushima Medical College in Japan. The paper was titled "In Vitro Anti-HIV Activity of Extract from Stevia Rebaudiana." A request came from the director to Dr. Takahashi to jointly investigate the practical application of Stevia Extract Liquid to HIV-infected patients in Kampala. After a few months of email

communication, Dr. Takahashi and I visited JCRC for any possibility of joint research and Stevia project in Uganda under ODA programs, and explained the detailed project plan. We will proceed with the plan by application for ODA funds.

Chapter 6 The Mechanism of Stevia's Effects on the Organism

Stevia makes a living body more resistant to diseases and stresses.

The efficacy of Stevia Extract Liquid is not only for farm plants and animals but for the human being. JBB Stevia Laboratory had an extensive study made on the safety by various public research institutes, such as ingredient analysis, doping test, acute toxicity test, skin patch test, dissolution tests on agrochemicals and nicotine, etc. Once it was confirmed and known really safe, some of the farmers using Stevia Extract Liquid for agriculture started to drink it, applied it on the skin, or put it in the bath. Very surprising reports came to us from them. So, we started to study it for health drink.

6-1. Why does active oxygen cause all kinds of illness?

Active oxygen has a Jykill-and-Hyde character.

Recently we hear more and more about active oxygen. It had been called "free radical" till several years ago, a technical term used among physicians only. It is commonly known in the modern medicine that active oxygen will cause most of diseases such as cancer, cerebral apoplexy, myocardial infarction, allergy, and so on.

How is active oxygen generated in the human body? Before explanation on active oxygen, I want you to know active oxygen has two functions, good and bad. First of all, I'd like to talk about the good function. Oxygen is indispensable for us to survive. Fresh oxygen is taken into the body by breathing, carried by cells to every corner of the body, and used to produce the energy required for the body when it combines with nutrients in a small body called "mitochondria" in the cells. Oxygen absorbed into white blood corpuscles and lymphocytes stands by to fight against harmful bacteria and virus that may invade the body. When they invaded, a signal is sent from the enzyme to the receptor in the cell membrane of the white blood corpuscle to activate the standing-by oxygen. The oxygen instantly gets activated with combination of other oxygen and hydrogen, becomes oxide or active oxygen (free radical or reactive oxygen). For example, when combined with oxygen, it becomes superoxide, when combined with hydrogen, it becomes hydroxyl radical, and when combined with water, it becomes hydrogen peroxide. They are all active oxygen and go out to kill the invaders. This is the good active oxygen's function.

But what about too much unused active oxygen generated in attacking the invaders? Naturally, active oxygen is not "bad" from the beginning. In a proper quantity, it kills such pathogenic bacteria and virus jointly with such immunocytes as leucocytes and lymphocytes.

Why is active oxygen so harmful when it is generated too much? Because its "oxidizing power is too strong." Some scholars call active oxygen "poisonous oxygen." When excessively generated, however, the same active oxygen acts to attack its allies, white blood corpuscles and lymphocytes. Further, it attacks and hurts lipids in the cell membrane, a security guard of cells, and indiscriminately damages the protein, DNA's, and mitochondria, the energy-producing factory, in the cells. These attacks cause various diseases. This is the bad active oxygen's function.

On top of the above invaders, active oxygen is generated in smoking and alcohol drinking, exposure of the skin to sunshine (ultraviolet rays) and radiant rays, exercise and fatigue, intake of polluted air and harmful chemicals via foods, mental stress, and so on. But the human body has the mechanism to automatically produce a strong enzyme called SOD (superoxide dismutase), which eliminates excessive active oxygen generated by the above causes.

The problem is that the capability to produce the SOD decreases from the peak of 20 years old to almost none at the age of 60. Then, what are the alternatives to protect our bodies against excessive active oxygen, especially for the aged? One way is to live a healthy life avoiding the above causes of smoking, too much drinking, too much exercise and fatigue, polluted air and water, and mental and physical stresses. The other way is to eat the foods containing much of anti-oxidizing substances such as β carotene, vitamins C and E, etc. These substances act in the body as good substitutes of SOD. We have to try our best to take these foods as much as we can, as we get older.

The mechanism that active oxygen causes diseases

The human body consists of about 60 trillion cells with each cell covered and protected by the cell membrane. The membrane is made of protein and various lipids, and what's most contained among lipids is unsaturated fatty acid. This unsaturated fatty acid is known to play a very important role (1) in having fresh oxygen and nutrients passed into the cell through the cell membrane, (2) in preventing harmful bacteria and virus from getting into the cell, and (3) in getting the waste material out of the cell. It has a capability to recognize friends and foes for the body. The unsaturated fatty acid in the blood capillary cell helps reduce the viscosity of blood for better blood flow. That's why it is called an indispensable fatty acid.

But it has a weak point, or it easily gets oxidized by active oxygen and become lipid peroxide. The lipid peroxide is the waste material of fatty acid, which has to be excreted out of the body. But what's worse is it helps generate active oxygen in a chain reaction such as (1) superoxide (O_2^-) with oxygen and oxygen combined, (2) hydrogen peroxide (H_2O_2) with oxygen and water combined, (3) hydroxyl radical ($\cdot OH$) with oxygen and hydrogen combined, and (4) lipid hydroperoxide ($LOOH$) with oxygen, hydrogen, and lipid combined.

What kinds of unfavorable phenomena may occur in our body when active oxygen into lipid peroxide oxidizes unsaturated fatty acid? First of all, more and more healthy cells get attacked by active oxygen or bacteria and virus, and die. The worst case is genes in the cell get damaged by the attack of active oxygen. In addition, active oxygen generates a substance called thromboxane A₂ that makes blood coagulate. This will cause thrombus, and then cerebral apoplexy and myocardial infraction. Also, the system to send a signal to dispatch anti-oxidizing enzyme SOD will be damaged.

Active oxygen is also much generated by unfavorable life habits.

First of all, the eating habit has been changed to the worse. Fruits and vegetables produced up to several decades ago by organic manure used to have much vitality with much of vitamins and minerals included which supplement the anti-oxidizing function of SOD (superoxide dismutase). For example, β carotene much contained in carrots and spinaches helps produce uric acid which controls generation of active oxygen. Vitamin C much contained in fruits helps produce SOD (superoxide dismutase). Vitamin E and vitamin B1 much contained in grains helps produce catalase, which controls generation of hydrogen peroxide. But the farm products cultivated by too much use of agrochemicals and chemical fertilizers have lost the vitality of these supplement nutrients and have absorbed harmful chemicals. Most of consumers are unconsciously eating farm products with much less anti-oxidizing supplement nutrients and much more agro-chemicals included.

Several decades ago, most people ate foods cooked out of raw materials at home. Now, they buy much more pre-cooked or processed foods in supermarkets, which include food additives such as artificial antiseptics, coloring agents, and fungicides. Also many kinds of pre-cooked or processed foods are prepared by oil, which easily gets oxidized into lipid peroxide during the period from the production till they are eaten. These factors are the causes to generate excessive active oxygen in the body.

Secondly, 30% of the population in Japan lived in the rural districts in the 1950's where there were no

factories which discharged smoke and waste water that contained harmful chemicals. With the drastic economic growth and the development of industries, factories and automobiles have tremendously increased and 70% of people have moved to live in urban and industrial areas. Now most of us are always exposed to polluted air and water which are taken into our body to cause generation of active oxygen.

Thirdly, much more risks of physical and mental stress in the very competitive society, especially in the city life. Hard and long work up to late at night, more unemployment and corporate bankruptcy, intensified competition for higher education, higher promotion, and for more business. There are many more old people with future anxieties and concerns. These are the causes of the stress which also generates active oxygen in the body.

Active oxygen is directly related to the top three death causes in Japan

No. 1 death cause is cancer, No. 2, cardiac diseases such as myocardial infraction and cardiac failure, and No. 3, cerebrovascular disorder such as cerebral apoplexy. Active oxygen is causing all these diseases and allergy. It also accelerates aging of our body. This is why active oxygen is the main cause of diseases and aging.

6-2. The secret of Stevia's anti-oxidizing activity has been identified.

The experiment on rainbow trouts carried out by Tohoku University

The group of the Laboratory of Marine Biochemistry, Faculty of Agriculture, Tohoku University was the first in the world to pay their attention to our study on Stevia Extract Liquid and to perform a scientific experiment for its anti-oxidizing activity. Here I should like to introduce to you a summary of their paper titled "The Effect of Anti-oxidizing Activity of Stevia Extract Feedstuff on Rainbow Trouts " which was presented at the Congress of Japan Fishery Science in 1994 and attracted much attention.

Rainbow trouts were used for the experiment, because they have a high content of highly unsaturated lipid acid, which is sensitively affected by a small volume of active oxygen. Observation was carried out on how organism activity in vivo would be affected in growth of rainbow trouts by addition of Stevia extract to diet with 10% of non-oxidized oil mixed and to diet with 10% of oxidized oil mixed. The 4 groups of 20 rainbow trouts each with the average weight of 6.5 grams were fed on each diet 3 times a day for 4 weeks.

The results of weight gain

Average weight gain

The control group 1 (no Stevia, oxidized oil) 99%

The control group 2 (no Stevia, non-oxidized oil) 143%

The Stevia group 1 (with Stevia, oxidized oil) 167%

The Stevia group with oxidized oil showed even a higher growth (167%) than the control group with non-oxidized oil (143%).

Just after the above experiment, the low oxygen tolerance test was carried out on 5 rainbow trouts of each non-oxidized oil group which were put into 500 ml of low oxygen water (DO 1.35 ml/l), and the time till every rainbow trout died was measured.

The results of lithal time

Average lithal time

The control group 2 (no Stevia, non-oxidized oil) 4.88 minutes

The Stevia group 2 (with Stevia, non-oxidized oil) 6.57 minutes

The low oxygen tolerance was substantially improved for the Stevia group.

The lipid peroxide volume in the serum was measured with the following results.

Average lipid peroxide

The control group 1 (no Stevia, oxidized oil) 9.6 nmol/ml serum

The control group 2 (no Stevia, non-oxidized oil) 4.5 nmol/ml serum

The Stevia group 1 (with Stevia, oxidized oil) 4.3 nmol/ml serum

Stevia Extract Liquid prevented an increase of lipid peroxide in the serum.

The anti-oxidizing activity of each extract liquid of green tea, Stevia leaves, and Stevia stems was measured with the following results.

Anti-oxidizing activity

Green tea extract 1

Stevia leaf extract 0.78 times as much as green tea extract

Stevia stem extract 5.3 times as much as green tea extract

All the above results scientifically proved that Stevia Extra Liquid, which was made of 80% of stems and 20% leaves, has a very strong anti-oxidizing activity to prevent generation of active oxygen.

A new discovery! The miracle of inorganic salts

Then, what kinds of ingredients in Stevia Extract Liquid produce such a high anti-oxidizing power? The secret has been found to be the synergistic effects produced by several kinds of natural inorganic salts and other ingredients.

According to the analysis by the group at Tohoku University, Stevia Extract Liquid contains such inorganic salts as potassium, sodium, magnesium, together with such vitamins as polyphenol, α -tocopherol (vitamin E), flavonoid (vitamin B2), β -carotene (vitamin A), pyridoxine (vitamin B6), niacin (nicotinic acid), biotin, pantothenic acid and natural yeast, etc.

What attracted my attention most among them was potassium inorganic salt contained in the greatest quantity of 2,200 mg per 100 ml of Stevia Extract Liquid. So, I asked the group to look into the anti-oxidizing activity of these salts.

Ingredients of Stevia Extract Liquid (per 100 ml)

Calorie 47 Kcal β -carotene 54 μ g Vitamin A 30 UI Vitamin B2 0.28 mg Vitamin B6 0.36 mg Vitamin E 0.17 mg Niacin 3.9 mg Biotin 17.4 μ g Phosphor 200 mg Calcium 120 mg Iron 1.3 mg Sodium 22 mg Potassium 2,200 mg Pantothenic acid 1.8 mg Acetic acid 0.37% Lactic acid 0.85% Heavy metal (pb) below 10 ppm Caffeine not detected Arsenic not detected

The tests were carried out by adding various inorganic salts to linoleic acid at 70°C to see how linoleic acid would get oxidized for 2.5 days. The results were that potassium carbonate showed 87 of the anti-oxidizing index, potassium bicarbonate 68, sodium phosphate 57, and potassium chloride 19. The most interesting figure we got was on potassium carbonate. With 2,000 ppm of potassium carbonate added to linoleic acid for 6 days, the index showed as high as 99 which means almost complete prevention of linoleic acid from being oxidized. This is a surprisingly high value. Even at a low density of 500 ppm, the index reached 80.

The anti-oxidizing activity against linoleic acid (at 70°C for 2.5 days)

Inorganic salts Density (ppm) Anti-oxidizing index

K₂CO₃ (potassium carbonate) KHCO₃ (potassium bicarbonate) Na₃PO₄ (sodium phosphate) Na₂CO₃ (sodium carbonate) KCl (potassium chloride) NaCl CaCl₂ MgCl₂ MgSO₄
2000 2000 2000 1000 2000 1000 1000 2000 2000 8768571919 ND * ND ND ND

* ND: Anti-oxidizing activity not detected

Reference: Japan Food Science Industry Journal, Vol. 45, No. 5

These examinations show that the strong anti-oxidizing power of Stevia Extract Liquid comes from the potassium salts much contained in the Liquid. Potassium controls the balance of pH in the body. When pH gets out of balance, it causes malfunctions of nervous cells and muscle cells, and then leads to poor urination and bowel movement, high blood pressure, arrhythmia, and palpitation, etc. It may also cause myasthenia syndrome, ileus, dull perception, and reduced reflex functions. Potassium is also essential to prevent diabetes because it activates a hormone called insulin, which is related to diabetes.

Further, potassium works to excrete excessive sodium out of the body and to reduce the blood pressure. The Japanese take more salt contained in their foods than Westerners. Especially people living in the northeastern part of Japan who eat a lot of salty dried fishes and pickles have long been suffering much more from high blood pressure and cerebral apoplexy than people in other areas.

But, only Aomori Prefecture in the northeastern part of Japan sees less numbers of such patients. This is because potassium contained in apples, with a large production in Aomori, is considered to excrete excessive sodium out of the body.

Potassium works to adjust the quantity of sodium in the body and prevent the harm of salt that raises blood pressure. Though potassium is contained in vegetables and oranges, 1-3g a day has to be taken for a person who weighs 70 kg. So many people tend to have a lack of potassium.

With the increase of processed foods containing much of additives in modern diet, the additives have reduced a lot of minerals and vitamins originally contained in the food materials, and they are consumed to detoxify additives in the body.

Hence, a vicious circle of less intake of potassium than required and more consumption of it in the body. Now, Stevia, which contains a lot of potassium, is in the spotlight. So, we have named those inorganic salts as "the super vitamins," and we have named Stevia, which contains a lot of "super vitamins," as "the immunizing plant."

The protective functions in the living body that enhance its immunizing power

Our bodies have in nature the protective functions called "homeostasis" which fixes troubles in any parts of the body machine by automatically sending repair technicians to the trouble areas. Homeostasis excellently controls every system of the body such as the immunizing system, the internal secretion system, the metabolism system, the blood circulation system, and so on. Thanks to the functions of homeostasis, the causes of diseases are automatically removed in advance to keep the functional balance of the whole body.

But if active oxygen is generated in the body more than a permissible level, the functions of homeostasis are getting weakened and damaged. To prevent this, our body has two kinds of defense forces against excessive active oxygen.

The first defense force is the enzymes as listed below that are generated automatically to eliminate excessive active oxygen. The quantity of these enzymes generated is large with young people, but at the peak of 20 years old it decreases with older people, and it comes near zero when they are older than 50s. At present, there are 10 kinds of active oxygen confirmed:

Active oxygen Structural formula Enzymes generated in the body Anti-oxidizing substances taken in from foods

1. Singlet oxygen $1O_2$ Carotenoid Uric acid Vitamin C Vitamin A
2. Superoxide O_2^- Superoxide dismutase Vitamin C
3. Hydrogen peroxide H_2O_2 Catalase Ubiquinone Glutathion peroxytase Pyruvic acid Vitamin E Vitamin C
4. Hydroxy radical $\cdot OH$
5. Lipid hydroperoxide
6. Lipid hydroperoxy radical
7. Lipid archoxy radical
8. Fatty acid radical
9. Hydroperoxy radical $LOOH$ $LOO \cdot$ $LO \cdot$ $L \cdot$ \cdot HOO Ubiquinone Bilirubin Vitamin B2 Vitamin A
10. Ozone O_3 Estrogen

“ \cdot ” shows that the substance is radical.

Reference: A paper titled “Fish and Active Oxygen” in a magazine “Farm Fishery”, Feb., 1997

The second defense force is anti-oxidizing substance like vitamins as listed above to be taken in from foods. These substances are more highly required by the old and the people under various kinds of intense stress who are much more exposed to excessive active oxygen in their bodies. Therefore, it is most recommended to take food and drink with very strong anti-oxidizing power such as Stevia Extract Liquid.

The Functions of the Natural Ingredients in Stevia Extract Liquid

Ingredients Major physiological functions If deficient

β -carotene (vitamin A) Controls cancer cells. Normalizes cells. Keeps eyes healthy. Reduced vital resistance, troubles of respiratory and digestive organs, cornified skins, increased wrinkles.

Niacin (nicotinic acid) Required for protein production. Troubles of digestive organs and sense and movement of hands and feet. Neurosis, digestive diseases, dermatitis, and buccal-lingual inflammation.

Sodium Keeps the body fluid alkaline. Sudden deficiency—weariness, apathy, dizziness. Long-term deficiency—reduced gastric acid, less appetite.

Iron Generates hemoglobin. Anemia, fatigue, headache, and loss of appetite.

Biotin Maintains skins and bone marrow. Dermatitis, conjunctivitis, weariness, muscle ache, gray hairs, fallen hairs.

Pantothenic acid Required for lipid metabolism. Hypoglycemia, gastric ulcer, dizziness, headache, palpitation, paralyzed feet and hands, convulsion, infectious disease.

Acetic acid Dissolves into carbonic acid and water. Adjusts pH in the body.

Potassium Adjusts the functions of the heart and muscles. Reduced muscular power, myasthenia, intestinal obstruction, reduced reflex function caused by reduced perception.

Phosphorus Enhances physiological function Weaker teeth, fracture, intestinal absorption disorder.

Calcium Strengthens teeth and bones. Osteoporosis, osteomalacia, hypersensitivity, irritation.

Magnesium Works for gene synthesis and enzyme reaction. Reduced metabolism, hyperemia, convulsion, arrhythmia.

α -tocopherol (vitamin E) Enhances blood circulation. Prevents aging. Increases skin gloss. Bad effects on hormones, damage of red blood cells, cold constitution, bad effect on blood pressure, reduced resisting power, muscle ache, circulatory organ disorder, flecks, pernio.

Pyridoxine (vitamin B6) Strengthens liver functions. Promotes fat metabolism. Eczema, angular cheilosis, anemia, dermatitis, cleft, fatigue, dandruff.

Flavonoid (vitamin B2) Strengthens mucosae of eyes, skins, and mouth. Fatigue, palpitation, short breath, numbness, dermatitis, stomatitis, keratitis, acne, eyestrain, foul breath, dropsical swelling, itch.

Stevia is also effective against AIDS virus (HIV)

At the 11th International Conference on Antiviral research held on April 5-10, 1998, in San Diego, California, USA, the research group of Fukushima Medical College presented a paper titled "In Vitro Anti-HIV Activity of Extract from Stevia Rebaudiana". The AIDS virus (HIV) that has got into a human body attacks the cores of its immunizing system called "helper T cells," replaces the genes of the helper T cells by the HIV genes, and produces more and more copies of the HIV genes. But according to their research, it has been found by their in vitro examinations that Stevia Extract Liquid prevents the AIDS virus attack at a rate of 82%.

At present, 9 kinds of AIDS-curing drugs such as AZT have been approved. But AZT only hampers the function of HIV, and does not attack HIV directly. It costs about US\$20,000 per year. Most of doctors in charge of HIV patients are pursuing more effective and less expensive measures by trial and error use of many combinations out of 9 kinds of drugs.

AIDS is now much feared as "the modern pest." AIDS patients are substantially increasing throughout the world. President Clinton stressed a crusade against AIDS in his annual State of the Union Message to Congress several years ago. Stevia Extract Liquid can be a boon to AIDS patients if it proves to be effective in clinical examinations.

Now I should like to present you very good news that a governmental institute in Kampala, Uganda, called Joint Clinical Research Center (JCRC), will start clinical examinations on HIV patients by use of Stevia Extract Liquid. In May 2000, the President of Uganda who came to know the above paper presented by Fukushima Medical College contacted the Japanese Embassy in Kampala for clinical help from Japan with Stevia. The HIV-infected patients in Uganda occupies about 10% of its population, and are threatening its economy and industry. Mr. Kashiwada, the honorary consul in the Japanese Embassy in Kampala, approached JBB, and after several exchanges of communication with JCRC, a joint project of JCRC, Fukushima Medical College, and JBB will be launched with financial assistance from JICA.

Stevia is also effective against helicobacter pylori

Helicobacter pylori is attracting attention as the bacteria which cause chronic gastritis, gastric ulcer, and gastric cancer. It is strong enough to survive in the gastric acid. Half of the Japanese are said to be carriers of the bacteria, and it gets activated when we lose our health.

Recently Stevia Extract Liquid has been found to be effective in inhibiting the activity of helicobacter pylori, and a clinical examination is being carried out in a hospital in Japan. The mechanism of inducement of cancer by helicobacter pylori is yet to be clarified, but many medical scientists say active oxygen has something to do with it. This is also a very interesting theme to be further studied.

Chapter 7 Stevia Produces Strong Health Power Many Testimonials on Experience with Stevia

7-1. No need to be afraid of adult diseases

A miracle of hepatitis C virus dying out completely

Case 1.

Yoshio Yamakawa, an owner of a firm in Ohita Prefecture, was shocked at his doctor's diagnosis on his hepatitis C that was detected by the recent medical checkup. He was told that it might develop to cerrhosis, then to liver cancer. He happened to know Stevia, and started to drink Stevia Extract Liquid 30 ml every day. After half a year, his hepatitis C virus decreased drastically, and disappeared completely after another two months. His doctor was much surprised at his recovery that was never experienced before. Here is his testimonial.

I went for a medical checkup when I became 50. I was told hepatitis C virus was detected, and there was a high possibility that it might develop to cerrhosis, then to liver cancer. As the president of my

company, I could not tell that to my wife and my employees. According to my doctor, I had to survive with the virus for the rest of my life. I got terribly depressed.

Incidentally, a friend of mine introduced me Stevia Extract Liquid. I started to drink it 30 ml every day, and after a while I came to feel a fresh wakeup and less fatigue in the evening after work. Every two months I had a medical checkup, and after half a year my doctor said with a great surprise, "You've got well from fatty liver with much less hepatitis C virus." I couldn't express how I was glad at his words. At the next examination, the antibody test proved negative. "You've been completely cured of it. I've never had this kind of case, but this is a fact," he said, inclining his head as if in doubt. After this I felt filled with hopes, and my business went well, too.

May I make some comments on this case? The carriers of hepatitis B and C virus in Japan amount to 2 million, and the deaths from liver cancer and cirrhosis have reached more than 50,000 per year. This report on hepatitis C virus disappearance with Stevia is epoch-making, and what ingredients took such an effect on the virus is to be identified for future study.

Case 2.

A 49-year-old woman in Hiroshima Prefecture had been suffering from languor in her whole body as well as lack of appetite with brown urine. She reluctantly underwent a 3-day medical checkup, and the result was hepatitis B with GOT/GPT values 350. Instantly she was hospitalized and put to absolute rest with intravenous drip injections and immunosuppressive drugs. After 2 months of hospitalization, she started her job again and worked for 2 months, but suffered a relapse. She returned to the hospital. Then she came to know Stevia, and started to drink a spoonful of the extract diluted in water every day. After 3 months, she began to feel better, and her doctor reduced drip injections to once a week. Her GOT/GPT values gradually decreased to 250 in half a year, then to 130 in another half a year, and now 70. After intake of Stevia Extract Liquid, she could eat any food deliciously. Before, she used to say "Tired" many times, and now she is feeling light. She has come back to work with better health.

Case 3.

A 62-year-old man in Tochigi Prefecture was diagnosed as having hepatitis C. He started to have much night sweat and feel worse while he kept taking hospital drugs. Then he ceased to take them and started to drink Stevia Extract Liquid every day. In 4 months his urine color turned normal, and his GOT/GPT values fell to 30.

Returning safe from the "double tragedies" of diabetes and asthma

Case 4.

Trying very hard to cure the severe diabetes with the blood sugar content of 450 and the neutral fat value of 661, Yumi Katsuta, a housewife in Tokyo, she controlled her diet too much and started to have serious asthma. Her weight reduced to as low as 37 kg and she lost her vigor. After half a year of drinking Stevia Extract Liquid every day, her weight recovered to 50 kg, and her blood sugar content and neutral fat value returned to normal. Now she doesn't have to take blood sugar-reducing drugs.

"3 years ago, I was 35 years old and quite healthy with 58 kg weight and 1.6 m height. One day I felt abnormally thirsty and had severe diarrhea and very frequent excretion of urine. I lost no time to go to hospital for diagnosis, and the examinations showed the blood sugar content of 450 and the neutral fat value of 661. I was found to have serious diabetes next door to the need of dialysis."

"I came to realize it came from my diet. I love sweets very much, and used to have cakes, chocolates and candies whenever I want to. So, I made up my mind to improve my dietary habits. I may venture to say that I am much resolved to that end."

"I started to go on a very strict diet of taking 1,200 calorie per day. This reduced my weight to 47 kg, the blood sugar content to 99, and the neutral fat value to 73 in half a year. After that, I increased caloric

intake to 1,600 calories, and my weight dropped further to 41 kg with the blood sugar content of 99 and the neutral fat value of 85.”

“But I did too much. I lost my physical strength and vitality. As I was allergic, I started to have a violent fit of asthma. To get rid of this, I relied entirely on steroid hormone drips. I could be free of asthma strokes, but I had its side effect of my face swollen. At last I lost my weight to 37 kg. Now I was the heroine of the “double tragedies” of diabetes and asthma.”

“Incidentally, I heard about Stevia from the wife of the president of the firm my husband was working for. I lost no time to drink Stevia Extract Liquid 30 cc every day, 10 cc before breakfast, 10 cc after lunch, and 10 cc before going to bed. Of course, I got approval of this from my doctor, who also recommended the intake of such anti-oxidizing, 100% natural drink.”

“In a week, I felt a little vigorous. In a month, 3 months, and half a year, the doctor got surprised to see my improvement. Now I have recovered my weight to 42 kg with a normal value of the blood sugar content at 97, the neutral fat value at 95, hemoglobin A1c at 6.2, and the insulin volume rising from 1.0 half a years ago to 3.2. This is a miracle for me. Now goodbye to the blood sugar reducing drug and the steroid hormone drug.”

Case 5.

A 50-year-old man in Tokyo had been suffering from diabetes for 10 years. With an every day’s controlled diet, he had to go to hospital every 3 months with the blood sugar content of more than 400. While he was taking blood sugar reducing drugs every day, it went down to 180~200. But when he ceased to take them, it went up quickly. Recommended by one of his friends, he started to drink Stevia Extract Liquid, 5 cc each in the morning and the evening, in June 1996. In the examination he had one month after that, it went down to 120. His doctor suspected the test result, and re-examined his blood with the same result. He stopped taking the blood sugar-reducing drug, but kept drinking Stevia with a controlled diet. Since then he has been normal and stable with the blood sugar content of 100~120.

Case 6.

Here is a testimonial of a 52-year-old man in Chiba Prefecture. “I run a real estate firm in Chiba Prefecture. I had been very busy dining and wining my customers, so my blood sugar content was found to be more than 200 in the health check last April.”

“I happened to learn about Stevia from an article in a magazine, and started to drink the extract liquid 30 cc every morning and some in my office. In one week after that, I felt fresh when I woke up and was beginning to clearly feel less tired from my work. In the re-examination in June, my blood sugar content went down to 124. I was surprised to realize that I have more vigor during work. In August, it fell to 98. I’ll keep drinking it for more health and work.”

Gastric ulcer that I had been suffering from for 10 years disappeared.

Case 7.

Kazuko Hatakeyama, a 53-year-old housewife in Osaka, had been suffering from gastric ulcer for 10 years, always relying on hospital medication. Recommended by one of her friends, she has been drinking Stevia Extract Liquid for half a year. Thanks to this, her gastric and intestinal conditions became very good with no more constipation. Her periodical gastric examination showed the gastric ulcers were gone. In two years, she doesn’t have to drink it any more. Here is her testimonial.

“I had had repeated returns of gastric ulcer for 10 years, and I could not live without the drug. I don’t know why, because I don’t drink nor smoke and I don’t like hot meals very much.”

“It was an autumn day in 1994, when I went to hospital for medicine and diagnosis. One of my patient friends started to talk about Stevia. She said Stevia would be good for any diseases. So, I started to argue with her. Good for any diseases means no good for anything, I said. Then she said, “Let’s make a deal.

I'll buy you a bottle of Stevia. Drink it, and you don't have to pay me if it does no good. But if it does, pay me the full amount." So, I said, "I'll drink it, but only one bottle."

"After one week, a bottle of Stevia Extract Liquid reached me. At a sip of it, wow! poor taste. So, I stopped drinking it. " When I met her at the hospital two weeks later, she asked me, "How do you feel?" So, I lied, "Nothing happened." But I felt guilty, and I started to drink some diluted in coke. I was suffering from severe constipation, but after a few days I realized my bowels started to move everyday. When I met her next time, I had to say, "It's good. I'll pay for the bottle."

I kept drinking, and after half a year I had a periodical examination, which showed ulcers disappearing. My doctor said, "You don't have to have endoscopy." I was so happy. After 2 years, I was told I didn't have to take any medicine any longer. Finally, I have been completely relieved of 12 years of ulcer pains.

7-2. Overjoyed to be relieved of incurable diseases

Case 8. Relieved of advanced cancer pains and recovered from the critical condition

In January 2000, Ichiro Kawasita, an owner of a firm in Osaka, had a phone call from his sister in Okayama City, "Dad's got hospitalized, and he is in a critical condition. Rectum cancer's spread. Come home right now." He beelined to the hospital that evening with some bottles of Stevia Extract Liquid, which one of his friends was selling as a distributor of JBB Stevia Laboratory, Ltd.

Ichiro showed the doctor a catalog of Stevia Extract Liquid, and got the doctor's consent to have his father drink it. He saw his dad almost dead in bed. He told his sister to have him drink 20 cc 3 times (total 60 cc) a day. He had to return to Osaka next morning on an urgent business.

He called his sister every evening to hear about his condition. In a week he had a call from her, "Ichiro, Dad started to take some meal! He can speak a little!" "Really?" He couldn't believe it.

In two weeks his father recovered his appetite and started to go to the men's room with her support. In 3 weeks the doctor told her that he got out of the critical condition. All his family was very happy. They don't think his cancer will be cured, but they hope he may be free of pains until he dies.

Case 9. Recovery from rectal cancer

A 56-year-old female patient in Iwate Prefecture had a rectoectomy in May 1990, but the cancer was found to have spread to her lungs. Since she started to drink Stevia Extract Liquid 3 times a day, its course was arrested, and she got better.

Case 10. Recovery from colon cancer

A 75-year-old male patient in Wakayama Prefecture had a colonoectomy by 40 cm. He drank Stevia Extract Liquid 50 cc everyday before and after the operation, and now he didn't have to take anticancer drugs any more. Though there was a possibility of cancer spreading, he is very well drinking the extract every day.

Case 11. Some recovery from gastric cancer

A wife in Osaka Prefecture started to have her husband in a hospital drink 10 cc of Stevia Extract Liquid everyday from January 1994. In two months he had a periodical examination, and his doctor found his cancer course being arrested. The doctor looked doubtful of why this happened.

Case 12. Subarachnoid hemorrhage was cured without an operation

Ume Tsugawa, a 72-year-old woman in Akita Prefecture, had subarachnoid hemorrhage caused by cerebral aneurysm breakage. Her doctor told her that she was too old for an operation. Incidentally she happened to learn about Stevia from one of her friends who used Stevia for agriculture, and started to

drink Stevia Extract Liquid. The first 3 weeks saw no change, but in one month her headache was gone, and ceased to have shoulder stiffness which is usually caused by subarachnoid hemorrhage. For one year, she didn't have a return of the disease, and now she can do housework.

Case 13. Recovery from cardiac infarction

Kazuko Kuroda, a 66-year-old firm owner in Hyogo Prefecture, got hospitalized due to difficult breathing. She was diagnosed as having hypertrophic pericarditis. Her myocardiac muscle was hypertrophic, and 80% of her heart had water. She had so much to do for her business that she left the hospital. Instead, She drank Stevia Extract Liquid everyday with Liquid-soaked gauze pasted on her chest. In two weeks she had an examination in the hospital, and her doctor was much surprised that half of the water was found to be gone. He said to her in doubt, "What did you do? Usually it takes about half a year to get rid of the water with medication." "I have reduced my weight from 77 kg to 66 kg for the past 4 months, and I am in good spirits."

Case 14. Recovery from intestinal obstruction

Kokichi Yonekura, a 67-year-old businessman in Fukuoka Prefecture, had been an "economic animal" working very hard in many overseas countries. One day he felt so tired and went to hospital for examination. He was diagnosed as having an intestinal obstruction with 7 polyps in his colon. He had a severe constipation, too. His son came to his hospital with Stevia Extract Liquid, and tenaciously urged him to drink it. Moved by his son's enthusiasm, he drank 50 cc before breakfast. Then next morning, he had a call of nature for the first time in 3 days. To his big surprise, he had a bowel motion very comfortably in a toilet. He raised a coke toast to his wife!

He had an operation of 20 cm colonoectomy. For one week, I was so exhausted. Strongly recommended by his son, he started to drink 30 cc of Stevia Extract Liquid everyday. Everyday he had a bowel motion, and in two weeks, he left the hospital. Wonderful with good appetite and bowel motion!

Case 15. Recovery from IgA nephrosis

Satoko Nishiyama, a 52-year-old housewife in Hokkaido, had been in weak health and often laid up with a cold. One day she had a high fever and went to hospital for examination. She was "sentenced" to have IgA nephrosis, and to be on the threshold of dialysis. Symptoms of IgA nephrosis are high blood pressure, pulstation, short breath, and reduced eyesight. She was so shocked that she could not do anything at home. In 3 days she happened to watch a TV program showing Stevia's functions. She contacted JBB and started to drink 30 cc of Stevia Extract Liquid everyday. After 3 years, she was enjoying an active life in swimming, aerobics, and tours with her friends.

7-3. Fight against Allergy

Case 16. Getting out of the severe itch

Namie Kuramoto, a 22-year-old college student in Kochi Prefecture, had been suffering from atopic dermatitis since she was 2 years old. She tried in vain every available medicine administered by many hospitals. Her skins got much cornfield like an elephant's ones, hard and dark. Nobody could have realized her tortures unless they suffered from these severe diseases. She slept with gloves on, and when she got up in the morning, she found her skins scratched around bleeding.

The only way she could rely on was the specific medicine "steroid hormone drug." It is very effective against allergy and atopy, but it will produce a severe side effect if used for a long time. It will spoil the stomach, liver, and kidney. So, she stopped using it, and a severe "rebound" attacked her. She had lymph glands much swollen under the arm, at the leg joints, and at the neck. The bed sheet and quilt were wet with yellow juice coming out from her skins. Her mouth got full of skin eruptions and she could not eat anything but soup and milk. She could not go to college. She never believed in anything. Her mother happened to learn about Stevia, and told her, "Take me at my word for this once and drink

this." But she could not even believe her mother. Tenaciously recommended that this was the only drink that reduced the side effect of the steroid hormone drug, she reluctantly started to try Stevia Extract Liquid, drinking 5 cc every morning, and applying it on her skins after taking a bath. One week, 2 weeks, and 3 weeks passed without any effect. She thought this was no good after all, and was about to stop using it.

In one month it was taking effect. Her itch was getting less, rashes were disappearing, and her skins were getting smoother. After several months, she had no more itch and recovered the normal skin that she had never had before.

Case 17. No more atopy

An 18-year-old woman in Toyama Prefecture had been suffering from atopy dermatitis since she was 5 years old. She tried many kinds of internal medicines, ointments, and herb medicines. But she had repeated cycles of a little better and relapses. One day she comes to know about Stevia, and the drowning lady caught at a straw of Stevia Extract Liquid. She kept drinking it and applying Stevia cream on her skin everyday for a year. Now she has had an unbelievable miracle of her smooth skin. This winter she never caught any colds that she had had every year before.

Case 18. Free from pollinosis

Pollinosis is caused by cedar powder, which spreads in the air from mid-February to the end of April. Millions of Japanese people who are weak against allergy have symptoms of running at the nose, being itchy at the nose and eyes, tearing, soar throat, and feeling heavy in the head.

Toru Nakayama, a businessman in Tokyo, had been suffering from this for 5 years, and had to go to hospital for medication in the spring. He happened to notice a book titled "The Miracles and Mysteries of Stevia, an Immunizing Plant" at a bookstore in autumn 1999, and read it through in one day with much expectation. He lost no time to buy Stevia Extract Liquid and started to drink 10 cc everyday. When cedar powder started to fly in late February next year, TV weather forecast was telling everyday that this year saw 3 times more of cedar powder flying than the average year. He had some light symptoms but did not have severe ones that he had been experiencing before.

7-4. Other diseases

Case 19. Acne and pimples

Hiroko Nakamura, a 27-year-old woman working for a firm in Hyogo Prefecture, had been suffering from many pimples on her face, chest and back for 10 years. She thought she might have a special constitution, and could not get married. Everyday she was gloomy. Of course she often went to hospital for medication.

A friend of her in her office recommended Stevia to her, and she started to drink Stevia Extract Liquid everyday. For one month nothing happened. But in 2 months, her friend said to her, "Hiroko, you look prettier these days, don't you?" She denied with a joy. She realized her pimples were getting smaller. She started to apply it on her skins with pimples. After one year, she saw herself in a mirror quite a different person with a smooth face skin but with some faded pimple scars.

Case 20. Cold

Noriko Kurahashi, a 55-year-old housewife, had an operation of kidney transplant in 1988 after making pyelonephritis worse. So, she had to take an immunosuppressive drug everyday. Her doctor told her, "Never catch a cold." But because of the drug, she often caught a cold and had to go to hospital. She was very afraid she might be killed by cold anytime.

One of her friend told her, "My son's atopy got better with Stevia. Why don't you try it?" She received a bottle of Stevia Extract Liquid from her, and tried a little. "Wow! Doesn't taste good!" But she kept drinking it everyday for her life. In two weeks a miracle happened to her. She woke up fresh, didn't get

tired in the evening, and didn't catch a cold in winter. One month later when flu attacked all of her family, they were sick in bed except her. She could not believe this. For the past 5 years she has never had a cold. Of course she is still taking the drug, but she is enjoying a normal life.

Case 21. Cold

A 5-year-old daughter of a housewife in Chiba Prefecture used to have her cheek swollen when she had a cold. After she drank Stevia Extract Liquid everyday, her pale-looking lips got pink, and ceased to catch a cold. She recommended Stevia to a girl in the neighborhood who had a bloody excrement due to a cold, and it stopped.

Case 22. Freckles

Yuko Takamori, a 38-year-old pub owner in Saitama Prefecture, had about 8-mm-large light brown freckles on her cheek. She didn't like it because she thought it was really noticeable. Her customers say to her, "You are beautiful, but I wish you were without this freckle." So, it was a regret to her.

One day she saw an article about Stevia in a weekly magazine that one of her customers left in her pub. Interested in it, she bought a Stevia cream and applied it on her freckle everyday after breakfast and before going to bed. Her husband was making fun of her, "How can such a cream be effective?"

In 7 months later, it GOT smaller and paler in color! Maybe it will be gone, she thought with much expectation. Her customers were also surprised at this, and some of them asked her to get the cream for their wives. She recommended the Stevia cream and lotion to them. In half a year, she received many thanks from them because their wives had paler freckles with Stevia.

Wondering why it was so effective, she phoned to JBB Stevia Laboratory. She got a reply as follows. Ultraviolet ray in sunlight produces a strong active oxygen on the skin which kills bacteria but also produces melanin pigmentation on the skin. Stevia Extract Liquid has a very strong anti-oxidizing activity and reduces the pigmentation. Elastin, one of proteins in the skin, protects the skin and keeps it smooth, fresh and flexible, but it is weak against strong active oxygen. Stevia protects elastin from being destroyed. Now she understood.

Case 23. Sunburn

According to a testimonial from a 63-year-old woman in Hiroshima Prefecture, she was easy to get suntan in summer and her face and arms had many small spots in early fall. She tried Stevia cream on her face and arms every day for a week, and she noticed the spots and the suntan fading away.

Case 24. Fallen hair

Nobuko Kusayanagi, a 38-year-old housewife in Nagano Prefecture who had a new baby, saw many hairs falling off when she shampooed her hair, and her hair looked much less glossy. This phenomena started just after her baby delivery. When she combed her hair, 10~15 hairs came off per one stroke. Her neighbors said, "Your hair looks dull." One day she came to know Stevia Extract Liquid, and started to drink it everyday. In one month, only 2~3 hairs fell off when brushing, and to her surprise, her hair got much more glossy and somewhat moistened. Her husband was also very glad to see her so changed.

Case 25. More appetite

A testimonial from a 45-year-old housewife in Saga Prefecture. Her son had an operation of pneumothorax, so he had a poor appetite and lost his weight and vigor. She urged him to drink Stevia Extract Liquid that he first refused to drink because of poor taste. "If you don't want to have another operation, drink it." In 2 months, he had much more appetite and was feeling better.

Case 26. Rough skin

A 22-year-old woman in Tochigi Prefecture was suffering from rough hand skins because she was so sensitive to dish cleaners. Application of Stevia cream made her hands smoother.

Case 27. Burn

A 31-year-old woman in Ohita Prefecture got severely burnt on her hand. She applied Stevia Extract Liquid on the skin just after the burn, and had a slight tingling pain. After a few times of application, her skin got completely cured in a week.

Case 28. Rashes

A 27-year-old housewife in Mitagi Prefecture put 5 cc of Stevia Extract Liquid into 100 cc lukewarm water, and applied it on her baby's rashes on the hip caused by a baby napkin. She kept applying it 3 times every day for 4 days, and all the rashes were gone.

Case 29. Athlete's foot

A 63-year-old man in Yamaguchi Prefecture had been suffering from severe dermatophytosis with his right foot's thumbnail broken. He had got his diabetes cured by Stevia Extract Liquid, so he thought it might be also effective against his athlete's foot. He applied it on the thumb every day for one week, and he saw a new nail coming out.

Case 30. Chronic throat bronchitis

A 64-year-old man in Tokyo had been having a soar throat always sniveling, and was diagnoses as chronic throat bronchitis at the hospital. He continued to go to hospital once a week for two years without much improvement. But recommended by one of his friends, he started to drink Stevia Extract Liquid. He got unbelievably better in a month. After that he kept drinking it, and did not have to go to hospital any more.

Case 31. Mole

A 28-year-old woman in Saitama Prefecture had a 2-mm mole on her left temple. She started to drink Stevia Extract Liquid and apply it on the mole everyday before going to bed in August 18, 1997, and it was gone on September 9, 1997.

Case 32. Asthma

A 39-year-old woman in Saitama Prefecture saw her daughter's asthma getting worse, so she had her drink 10 cc of Stevia Extract Liquid diluted in coke for a few days, and her asthma fits stopped.

Case 33. Gout

A 61-year-old woman in Tokyo had been suffering from gout with a high uric acid value for 10 years. Though she was taking medicine and taking care of diet, she did not get better. Recommended by one of her neighbors, she started to drink Stevia Extract Liquid everyday. The periodical medical examination after 4 months showed a substantial decrease in uric acid value. Now she doesn't feel tired and can get up fresh.

Case 34. Constipation

A 37-year-old woman in Tokyo had been suffering from severe constipation. When she called on one of her friends who saw her constipation cured by Stevia Extract Liquid, she drank 10 cc of it. Next morning, she was surprised to have had a good bowel movement, so she continued to drink it everyday. Next summer she went to her parents' home for one-week stay without Stevia Extract Liquid, and she had constipation again. Now she cannot live without it.

Case 35. Rheumatics

A 35-year-old man in Tokyo wanted to have his rheumatics cured by all means, and took Predonine administered by his doctor. But after a while his doctor became reluctant to administer the drug because

its continued intake might spoiled his liver and kidney. He happened to know about Stevia Extract Liquid, and started to drink it together with the drug. In a week his pains were gone and after that he had no bad side effect of the drug.

ATTENTION !! Stevia Extract Liquid is not a drug but a mere drink for health. Please note that it plays a role of supporting a drug. Please consult with a doctor for your disease, and don't drink Stevia Extract Liquid without professional guidance on your disease. For example, diabetes can be caused by many kinds of factors, and you need to have a periodical examination by your doctor. According to his medical guidance, you have to keep proper diet and to have continuous exercise avoiding excessive stresses. Stevia Extract Liquid will help you get better by its immunizing power.

Case 36. Iritis

A 58-year-old woman in Saitama Prefecture had a pain in her eyes due to high ocular tension. When she looked at a light, she saw a rainbow circle around the light. She was diagnosed as having iritis. After she started to drink 10 cc of Stevia Extract Liquid everyday, she had less pain. When she had a severe pain, she drank 10 cc three times a day, and the pain abated.

Case 37. Glaucoma

This is a testimonial of Dr. Xi of Associate Professor of Shanghai Fishery University.

"I came to Tohoku University from China to get a doctor's degree. Due to too much study, I came to have a severe pain in my eyes. I managed to reduce it with herb medicines, but I went to hospital. It was diagnosed as glaucoma, and I was administered with a lotion and internal medicines. Though hyperemia on the eyes was gone, I still had the pain."

"Recommended by one of the doctors in the university, I drank Stevia Extract Liquid. I was surprised that the pain stopped in 40 minutes. What's best is no side effect by this drink. Of course, it may not cure my glaucoma, but I can be relieved of the pain. I think this is epoch-making. I will continue to have glaucoma cured with medicines, but I cannot live without the drink."

Leave me with your hair trouble! I have developed an original hair-growing treatment with Stevia. Yuko Yokoshima, a Beauty Specialist Fascinated by the mysteries of Stevia Extract Liquid introduced in the book titled "The Miracles and Mysteries of Stevia" written by Mr. Naohiko Sato, I started to recommend it to my friends and acquaintances. One day I visited Mr. Sato of JBB Stevia Laboratory, and he told me a fact about a dying bonsai tree. When diluted Stevia Extract Liquid was sprayed on the tree leaves for several days, it started to have young green leaf buds coming out. An idea flashed across my mind that spraying Stevia Extract Liquid on a bald head might make new hairs come out. I thought the strong anti-oxidizing power of the liquid would inhibit active oxygen in the head skin and might make new hairs grow on a bald head. I came to believe that removing dirt out of pores of the skin and reducing lipid peroxide in the skin tissue might help new hairs grow. I got my customers' consent to experimental application of Stevia Extract Liquid on their thinly-haired head after full explanation on Stevia, and started to apply it. I tried many kinds of mixtures of the liquid and other materials such as deep sea minerals in different density. I repeated many tests on 40 customers. To my big surprise, the tests showed some effects on everybody's head. Mitsunobu Yuuki, who is working for a hospital in Oume City, was one of them. "This is really a great surprise. I was completely hopeless of having hairs because of inheritance. Thanks to being one of the subjects of her experiments, I can now comb my hair!" So, I have developed my original hair-growing system with Stevia consisting of a hair basic, a pack, and a shampoo. It will remove dirt such as oxidized skin fat, and improve the head skin. It will stop falling hair. Don't give up with the thinly haired, partly baldhead. I will show you how to use these 3 items of the system as follows: ① Shampoo your hair and head, wipe them with dry towel, apply the hair basic,

and massage your head. ② After a massage, apply the pack on the head, and wait for about 15 minutes. ③ Then rinse off the pack with water. ④ Repeat the procedures ①②③ everyday until the hair basic bottle becomes empty.

Case 37. Hair getting thicker

A 45-year-old executive in Hokkaido had been worried about his hair getting thinner in the center of his head since 35 years old. On the mirror on the elevator ceiling, he was shocked to see the thinner area getting wider.

Strongly recommended by one of his friends, he started to apply Yuko's hair-growing system in mid-February. Though he was told that all the 40 examinees had their hairs grow thicker, he was still suspicious. So, he shampooed and applied the hair basic only once a week, but he did not apply the pack. In 3 weeks, he clearly saw short, thin hairs coming out on the bald area. His sister came to his home and got surprised to see his change on his head.

Encouraged by this effect, he started to take all the procedures of the system every few days. In 3 months, he has now thicker new hairs and keeps applying with much more expectation.

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Publicado en [Diabetes](#), [STEVIA](#) | 19 comentarios

19 comentarios

Claudia

en agosto 16, 2009 a 4:43 pm | [Responder](#)

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fumiganlleida

en agosto 22, 2009 a 2:38 pm | [Responder](#)

ja fa mes d'un any, com van anar les probes amb les verdures?

salut



Carlos Eugenio

en junio 29, 2010 a 10:30 pm | [Responder](#)

Conseguí traducirlo con el traductor de Windows, luego lo leere. por la ojeada que le di antes de guardarlo parece interesante.



Alma

en enero 26, 2012 a 11:28 pm | [Responder](#)

Que Dios te bendiga por maravillosa aportacion y lo que alluda saber de esta planta.
 Tendras mas informacion de el Neem, seria perfecto.



joseppamies*en enero 27, 2012 a 10:42 am | [Responder](#)*

Hola Alma, del Neem solo conozco lo que he podido leer en libros, pero la utilización en humanos no tengo experiencia propia ni de conocidos. Si tu puedes aportar alguna experiencia vivida te lo agradeceríamos todos. Se dice que son innumerables sus propiedades pero aún no he podido profundizar en esta planta.
Un abrazo.

**Rafael***en agosto 23, 2012 a 1:20 pm | [Responder](#)*

La Stevia es bueno para la Dermatiti Seborreica?

**joseppamies***en agosto 23, 2012 a 3:52 pm | [Responder](#)*

La Stevia te puede ayudar , pero lo primero es dejar de utilizar jabon Gel y Champu industrial . Hacer uso solo de jabones como los descritos en este artículo <https://joseppamies.wordpress.com/2012/03/19/oreal-men-expert-o-jabon-extra-virgen-natural/> y masajearse con los propios orines una vez al dia.

**luis***en septiembre 25, 2012 a 8:03 am | [Responder](#)*

Josep,

Cual seria el modo de aplicar la stevia para tratar la dermatitis seborreica o eczema? se puede aplicar la infusión directamente?

Alguna otra experiencia positiva al respecto?

Gracias

**joseppamies***en septiembre 25, 2012 a 8:09 am | [Responder](#)*

Sí, se puede aplicar la infusión de stevia directamente por dentro y por fuera

**luis***en septiembre 25, 2012 a 10:30 am | [Responder](#)*

Bon dia Josep,

Agradecería por favor me dieras respuesta a estas preguntas/dudas:

- Cuando explicas lo de preparar una infusión para 2 días, puede en ese tiempo perderse gran parte de las propiedades medicinales?
- Recomendas reproducir por esquejes en esta época? soy de Barcelona, la planta madre sigue creciendo y sin brotes con flor, pero no sé si será tarde para reproducirla por esquejes.
- La planta que se reproduzca por esquejes debe recibir mucha luz o puede aguantar con solo claridad?

Gracias

**joseppamies***en septiembre 25, 2012 a 8:00 pm | [Responder](#)*

Siempre es mejor preparar una infusión como máximo para un día para no perder parte de sus propiedades. En recipiente cerrado y en la nevera pueden aguantar unos días sus propiedades.



En estos momentos ya no es recomendable hacer esquejes . La mejor época es Abril, Mayo, Junio y Julio

luis

en [septiembre 26, 2012 a 6:51 am](#) | [Responder](#)

Gracies Josep.

Si ya no es tiempo de esquejes, como se pueden secar las hojas para consumo. Es mejor esperar a que florezcan?

Como hemos de preparar la planta durante el invierno?



José llopart

en [septiembre 26, 2012 a 1:23 pm](#) | [Responder](#)

Hola me gustaría saber cuando se tiene que podar la stevia y si las hojas que salen de lo que se poda las puedo secar para hacer infusiones.muchas gracias.



Neus

en [septiembre 26, 2012 a 6:32 pm](#) | [Responder](#)

Hola Josep, me han hablado muy bien de ti y de la stevia, me lo comentaron porque yo padezco migrañas , y ahora las tengo mas fuertes porque estoy con hormonoterapia tras un tratamiento de cancer de mama. Las migrañas las tengo cada 15 dias y me duran un par de dias, asi que es muuuy pesadito. Mi pregunta es: la stevia puede ayudarme? tienes alguna sugerencia para aliviar mis migrañas?

Muchas gracias por tu tiempo, Neus



joseppamies

en [septiembre 27, 2012 a 2:16 pm](#) | [Responder](#)

Las migrañas pueden ser provocadas por muchos motivos: Digestivos, ansiedad-stres, cervicales inflamadas, intolerancias a lacteos y gluten, etc. La stevia puede ayudar y la marihuana en pequeñas dosis también, porque es a la vez analgésica , antiinflamatoria y antitumoral.



Pablo

en [enero 4, 2014 a 4:01 am](#) | [Responder](#)

exelente blog josep , se agradece la enorme informacion , Bien ahora este producto servira para tratar el acne .Lei un caso que comentan algo sobre esto tienes mas antecedentes respecto

saludos



joseppamies

en [enero 6, 2014 a 10:10 am](#) | [Responder](#)

Tomar Stevia con Cardo mariano o cualquier otra planta hepatica disminuye el acné, si es provocado por un deficiente funcionamiento del Hígado.

En caso de mejeres, si es por una desregulación hormonal, con problemas en la menstruación, utilizar la mezcla de Milenrrama y Bolsa de pastor.

En aplicación externa, la propia orina hace milagros.



raquel

en [enero 9, 2014 a 11:57 am](#) | [Responder](#)



Hola josep.mi hijo debuto con diabees el pasado septiembre.aun esta en la luna de miel y las dosis de insulina que requiere son pocas.desde que le diagnosticaron y empeze a buscar alternativas y encuentre la stevia pero no se muy bien como utilizarla y si eso le ayudara.gracias por tu informacion

joseppamies

en *enero 9, 2014 a 5:27 pm* | [Responder](#)

En estos momentos que no hay planta viva solo hay la opcion de utilizar hoja de stevia seca para infusiones. Si el niño es muy joven y hay dificultades en hacerle tomar un par de infusiones al dia se puede micronizar la hoja en un molinillo e introducirla en magdalenas caseras en vez de azucar, en el pan si se hace en casa , etc .



En verano es mas facil porque se puede ingerir directamente unas hojas tiernas de la planta . Con ello se logra muchas veces volver a poner el pancreas en marcha alargando en algunos casos casi indefinidamente la luna de miel. Sobre todo ajustar la dieta a la llamada alcalina dado que con ello evitamos puntas de azucar <http://www.dolcarevolucio.cat/es/recomendaciones-generales/recomendaciones-para-diabetes>

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