



DYNAMICALLY FREEZE DRIED SPROUTED ORGANIC BLACK RICE

Scientific name: *Oryza sativa*

A Link to an interesting article on Black Rice <https://youtu.be/cWzkyrZ21sc>

Dynamically Freeze Dried Sprouted Black Rice Powder is a one-of-a-kind functional food with a broad spectrum of popularity and application that is unique to the market.

Black Rice also referred to as Purple Rice and, in Thailand as “Mountain Rice” (*khao doi*) , is a dry - land rice, rich in anthocyanin antioxidants, minerals and vitamins. It is the most nutritious variety of rice with higher nutritional values than either white or brown rice. Black rice is a bran-complete whole-grain which is gluten free, cholesterol free, low in fat, sugar and salt yet high in fiber, anthocyanin antioxidants, Vitamins B and E, niacin, thiamin, magnesium, iron and phosphorous.

The Ultimate Functional Food:

The combination of attention to scientific detail with renewed reverence for correct cultural preparation has given life to the ultimate Functional Food. “Functional Food” is an industry category assigned to foods that deliver therapeutic levels of beneficial constituents in a convenient Whole Food form. Our product maintains consumer acceptance as a common food while providing extensive scientific research of its health benefits. Independent studies have shown positive results from sprouted black rice in weight management, treating various forms of inflammation, regulating blood, gut rehabilitation, and even certain forms of cancer.

Category Management:

The Natural food industry as well as mass market utilizes a system known as “Category Management”. Categories are created to designate shelf space for products that fit into specific dominant buying trends.

The hottest selling and most consistent categories are as follows:

- Gluten Free
- High Fibre
- High ORAC (Antioxidant rich)
- Low Glycemic
- Weight Management

The complex nature of our dynamic freeze dried sprouted black rice powder will place us in the following categories:

- Gluten Free
- High Fiber
- High ORAC (Antioxidant rich)

- Low Glycemic
- Weight Management

Solubility

As a food ingredient black rice is highly soluble. Solubility ties into taste as well as ease to combine with other ingredients. Given very low acidity, it mixes well with most ingredients. This high level of solubility (enhanced by the dynamic freeze dry process which creates a more soluble particle structure), low acidity, and metabolic rate makes our sprouted black rice powder a catalyst ingredient that mixes well into a wide range of formulations.



Organically Certified Black Rice Fields



Inspection Prior to Harvest



Fully Mature Black Rice



Soft-Milled for Maximum Benefits

Thai Freeze Dry works with organically certified black rice co-ops, which are comprised of Hill Tribe farmers. An important part of our corporate culture is to support these farming communities in their attempts to obtain a sustainable income.

Black Rice: the Emperor's Rice

In ancient China, Black Rice was set-aside exclusively for Royalty. It was thought that it would extend their lives. In light of recent scientific studies on the anti-aging effects of antioxidants it seems that this ancient knowledge was on the mark.

Black Rice is highly nutritious when compared to other varieties of rice. Black Rice is very rich in fibre (necessary for a healthy and regulated digestive system), as well as iron, vitamin E and a host of other crucial minerals.

The Production Of Sprouted Black Rice Powder



Black Rice Sprouts Equal To
One Serving



Loading The Machine



Super-Freeze With Liquid CO2



Sprouted Black Rice Powder
Superfine dry powder no
grinding required



1 Serving = 4 grams of Sprouted
Black Rice Powder



Finished Bottled Product

Organically Grown: Rice cultivation typically involves substantial use of chemicals. Wet-land rice, grown in the same rice paddies over many years, depletes the soil to the point that considerable use of chemicals is required. In contrast, all of our black rice is organically grown.

F.D.A. Approved / G.M.P. Certified: Thai Freeze Dry's Factory is F.D.A. Approved and G.M.P. Certified and our Sprouted Black Rice Powder product is approved by the Thai F.D.A.

Soft-Milled: The normal milling of “cargo” rice (rice for export) requires that the rice germ and the vast majority of the kernel be removed. At the end of this milling process most of the benefits have been removed; the anthocyanin antioxidants, fibre and nutritional ingredients are lost in the normal milling process. **Our unique soft-milling process delivers a “bran-complete” product removing only the husk leaving the kernel with 100% of the bran intact.**

This process insures that:

- the anti-oxidant levels remain high and complete as nature intended
- nutrients in the bran are delivered intact
- The bran-complete powder delivers a dose of fibre which helps to regulate the pace at which complete foods move through the digestive tract.

In addition, some countries require that the milled rice be steamed prior to shipment. The exposure to extreme heat denatures the enzymes and diminishes the value of thermo-sensitive vitamins that may have survived the normal milling process. CPT Superherbs dynamically freeze dried powder is stable making these precautions unnecessary, as our rice is not exported as rice grains but in superfine powder form, thereby cannot be re-planted or bring contaminants of any kind to the importing countries.

Sprouting:

Our process respects traditional knowledge regarding the consumption of rice. In Northern Thailand and surrounding areas, sprouts of all kinds are consumed as food while non-sprouted seeds are used for planting. By sprouting our black rice we create an easily digestible food in its culturally correct form eaten as nature intended. Several top selling books have been written on the “Paleolithic” theory explaining the benefits of eating sprouted foods. This theory has launched a popular long-lasting dietary trend to the point of becoming a foundation for nutritionists.

Sprouts are one of nature's most complete and nutritionally beneficial foods. Rice is designed by nature to remain dormant until it is fully mature and the right growing conditions exist. This dormant stage is enforced by enzyme and nutrient inhibitors such as phytic acid. In the sprouting process these inhibitors are neutralized and the enzyme and nutrient profile changes dramatically.



Sprouting Machines



Black Rice Sprouts

Thai Freeze Dry utilizes state-of-the-art commercial sprouting machinery. Computerized controls allow us to adjust the speed and frequency of the rotation of the drums, adjust moisture levels, and regulate temperature and airflow to achieve safe sprouts.

Nutritional data (per 100g) of TFD Sprouted Black Rice Powder*:

Nutrient	Amount
Alanine	0.437 g
Arginine	0.569 g
Ash	1.27 g
Aspartic acid	0.702 g
Calcium, Ca	33 mg
Carbohydrate, by difference	76.17 g
Copper, Cu	0.277 mg
Cystine	0.091 g
Energy	1515 kj
Energy	362 kcal
Fatty acids, total	0.971 g
Fatty acids, total polyunsaturated	0.959 g
Fatty acids, total saturated	0.536 g
Fiber, total dietary	3.4 g
Folate, DFE	20 mcg DFE
Folate, total	20 mcg
Glutamic acid	1.528 g
Glycine	0.369 g
Histidine	0.190 g
Iron, Fe	1.80 mg
Isoleucine	0.318 g
Leucine	0.620 g
Lysine	0.286 g

Nutrient	Amount
Magnesium, Mg	143 mg
Manganese, Mn	3.743 mg
Methionine	0.169 g
Niacin	4.308 mg
Pantothenic acid	1.493 mg
Phenylalanine	0.387 g
Phosphorus, P	264 mg
Potassium, K	268 mg
Proline	0.352 g
Protein	7.50 g
Riboflavin	0.043 mg
Serine	0.388 g
Sodium, Na	4 mg
Thiamin	0.413 mg
Threonine	0.275 g
Total lipid (fat)	2.68 g
Tryptophan	0.096 g
Tyrosine	0.281 g
Valine	0.440 g
Vitamin B-6	0.509 mg
Water (added in the LAB to enable testing)	12.37 g
Zinc, Zn	2.02 mg

* Tested, approved and certified by Central Laboratory(Thailand) Co. Ltd.

Dynamic Freeze Drying:

Fresh “Dynamic Freeze Drying” is a key component in the creation of our functional foods. It allows us to preserve a Whole Food in its fresh form, thus maintaining all of the medicinal activity of a live plant while providing the safety of a stable commodity.

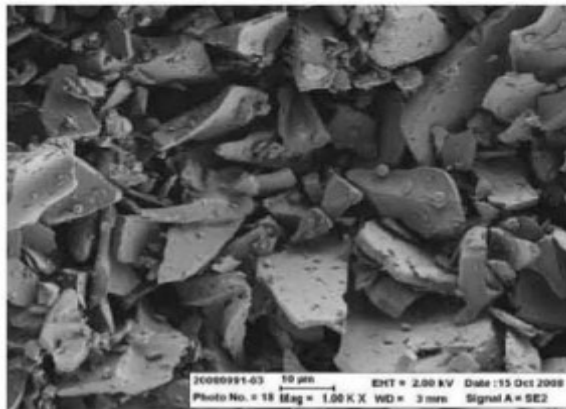
This proprietary and transitional preservation process gives us the unique ability to provide superior product. The rice is dried while it remains frozen in a vacuum. Rather than sitting motionless on trays (as in the conventional tray freeze drier), the product is flying round in a vortex. The deeply flash-frozen granules decrease in size due to sublimation of the connecting ice structure and break into increasingly smaller particles along natural elemental fracture lines.

This creates a smaller particle size and porous particle structure without the cellular hemorrhaging caused by mechanical grinding. These particles are much more easily absorbed and metabolized (more bio-available), and are more soluble for use as a catalyst ingredient in other formulations.

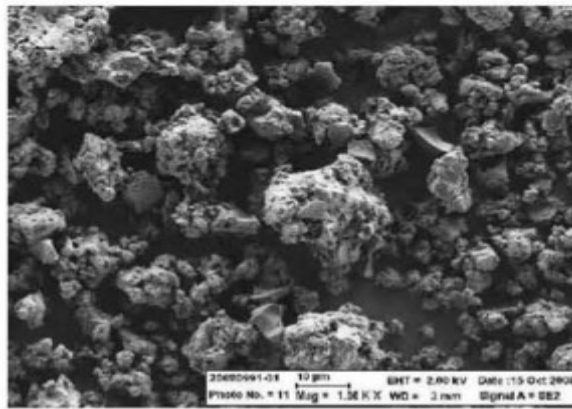
Louisiana State University (Department of Food Sciences) researchers have suggested that food manufacturers can use black rice as a catalyst ingredient to boost the health value of cereals, beverages, shakes, smoothies, rice cakes, ice cream, gelato, yogurt, noodles, protein and meal replacement bars, snack foods, cookies and other baked goods and packaged foods.

The quality and effectiveness of our black rice powder is the result of the remarkable protocols and processes we employ from the fields to the finished product. For details on this evolutionary process, please refer to our Dynamic Freeze Dry Process <http://www.cptsuperherbs.com>

10 μ m scale



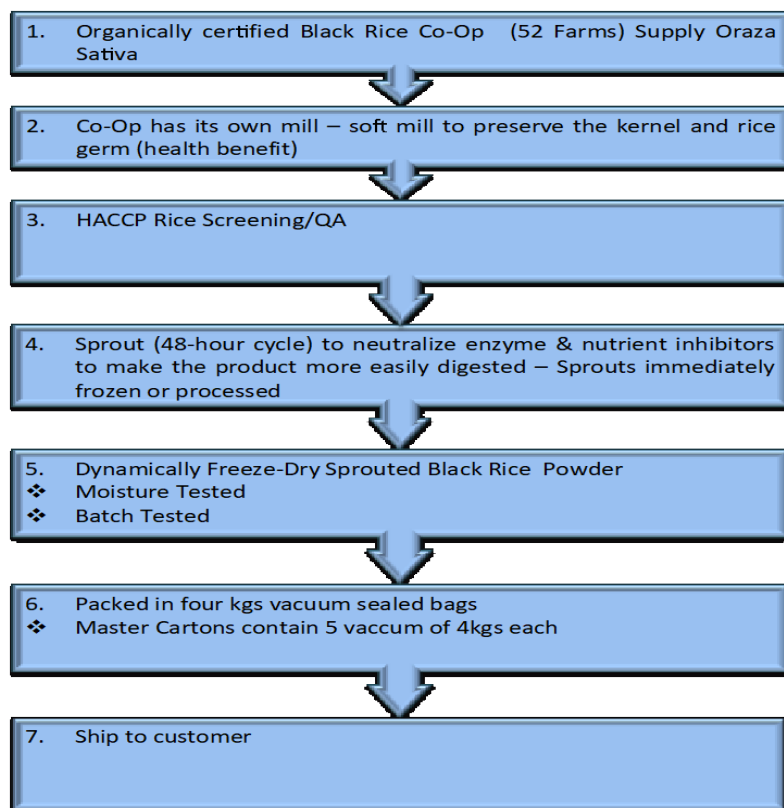
Tray Freeze Dried/Mechanically Ground



Bio-Dynamic Freeze Drying Particle Structure

- Organically grown black rice
- F.D.A. Approved / G.M.P. Certified /Halal Certified
- Soft-Milled and Bran-Complete to preserve the beneficial qualities of the raw rice
- Sprouted to eliminate enzyme and nutrient inhibitors
- Dynamically Freeze Dried for best preservation and highest bio-availability/solubility

Black Rice Production Diagram



HEALTH BENEFITS OF BLACK RICE

Black Rice Powder can be used in formulations to boost the health value of breakfast cereals, meal replacement/power bars, beverages, baked goods, noodles and a broad spectrum of products. The high level of solubility due to our small particle size and porous particle structure make it an exceptionally soluble ingredient. In addition to formulations which include black rice, we provide black rice in pure powder form for our customers to utilize in their own formulations. This empowers customers to determine their own health destiny and make a sound investment in their most precious asset.

Why should I eat black rice? What are its benefits?

This may be best answered by referring to just a few among the huge number of scientific studies that focus on black rice and provide insight into why our sprouted black rice powder is one of nature's most well-balanced "super-foods" truly remarkable in its abilities.

Sprouted black rice is a bran-complete, antioxidant rich, super food packed with nutrition. It can be taken as a complete meal, a nutritional supplement, or as an ingredient in shakes, smoothies, on cereals etc.

Antioxidants:

A distinguishing characteristic of Black Rice is the strong anthocyanin antioxidants contained in the deep-purple flavonoid pigments in its kernel. The strong antioxidant properties of Black Rice make it

an effective anti-inflammatory food; which helps cut down on general infections and illnesses. Many health reports point out that anthocyanin's protect against damaging free radicals that can give rise to a wide spectrum of serious health problems.

Dr. Zhimin Xu, associate professor at the Department of Food Sciences of Louisiana State University reports that "Just a spoonful of black rice bran ... contains more health promoting anthocyanin antioxidants than are found in a spoonful of blueberries, but with less sugar, and more fiber and vitamin E antioxidants."

- *Findings announced at 240th National Meeting of the American Chemical Society (ACS) Boston, Mass.*

Cornell University researchers found that antioxidant content was approximately six times higher in black rice than in common brown/white rice. The black rice bran had higher content of phenolic, flavonoids and anthocyanin.

- *Journal of Agricultural and Food Chemistry, July 14, 2010; 58(13): 7580-7*

Hypertension:

In an article published in the "American Journal of Clinical Nutrition" investigating the consumption of major flavonoid groups (flavonoids, flavones, flavones, flavan-3-ols, proanthocyanidins, and anthocyanin) determined that anthocyanin were the group most significantly associated with prevention of hypertension.

- *Cassidy; Habitual intake of flavonoid subclasses and incident hypertension in adults; American Journal of Clinical Nutrition (2011) 93:338-347.*

Satiation / Weight Management:

Satiation is a complex neurobiological phenomenon mediated by hormones and enzymatic reactions that send signals to the brain associated with the recognition of the feeling of fullness (satiety). In general, when your food provides adequate nutrition, receptors in the brain say "enough." Your body is getting what it needs and this subconscious neurobiological realization signals you to stop eating. The highly nutritious nature of sprouted black rice powder promotes satiation in this respect. An understanding of human appetite regulation needs to account for the ongoing and recurring drive to eat and the suppression of eating via satiety signaling.

In the case of black rice there is a super-satiation effect that can greatly assist all those for whom weight management is a concern. In the dark purple flavonoid pigments in rice kernel (pericarp) there are seven distinct anthocyanin species many of which are localized. Due to different localization patterns these are not released and digested in the same place and at the same time in your digestive tract. The effects are felt over time. They are, in a sense "time released." The recognition process and digestion of the multiple species of anthocyanin slows the pace at which food moves through the digestive tract allowing for better digestion and absorption. In addition, the anthocyanin carried in the fibRE slow down the oxidation of the food causing it to move more slowly through the digestive tract to be more completely processed.

- *Different Localization Patterns of Anthocyanin Species in the Pericarp of Black Rice Revealed by Imaging Mass Spectrometry* Yukihiko Yoshimura, Nobuhiro Zaima, Tatsuya Moriyama and Yukio Kawamira Published online 2012 February 17, doi: 10.1371/journal.pone.0031285

Black rice has antioxidants woven through a carrier that is nutritionally well balanced, high in fiber (soft-milled and bran-complete) and very low in sugar. Other foods with high levels of antioxidants (blueberries for one example) may also be high in sugar. Sugar oxidizes quickly and may neutralize any satiation benefit.

Cyanidin-3-glucoside -- C3G:

This is an antioxidant found in abundance in the dark pigments of black rice that effects the gene expression of fat metabolism. It turns off the gene expression for fat storage and turns on the gene expression for fat metabolism. You burn fat instead of storing fat. This makes black rice an effective and safe vehicle for weight management.

- *“Microarray profiling of gene expression in human adipocytes in response to anthocyanins”* _Takanori Tsuda, Yuki Ueno, Toshikazu Yoshikawa, Hitoshi Kojo, Toshihiko Osawa *Biochemical Pharmacology* 71 (2006) 1184-1197

Scientific studies using rats (with dosage adjusted to the human equivalency of 250 mg C3G) indicate that in thirty days, C3G reversed the weight gain of a high fat diet to the level of a normal diet. Weight gain was significantly lower in the high fat diet plus anthocyanin as compared to the high fat diet only.

- Kwon; Anti-Obesity and Hypolipidemic Effects of Black Soybean Anthocyanins; *Journal of Medicinal Food* (2007) 10:552-556.

Anti-inflammation:

Researchers at Ajou University in Suwon, S. Korea tested brown rice and black rice for their effectiveness in protecting against skin inflammations and found that the black rice bran suppressed dermatitis, but the brown rice bran did not. This scientific study suggests that black rice may be a “useful therapeutic agent for the treatment and prevention of diseases associated with chronic inflammation.”

- *Journal of Agricultural and Food Chemistry*, Aug. 23, 2010: 58(13):7580-5

In a study published in the “American Chemical’s Journal of Agricultural and Food Chemistry,” researchers found that mice fed with a diet supplemented with ten percent black rice bran significantly reduced inflammation and also found that black rice bran inhibits the release of histamine, a chemical that triggers inflammation. Black rice consumption can alleviate allergic dermatitis symptoms such as swelling, and allergy and asthma sufferers may find relief by adding black rice to their diet.

- *U.S. Dept. of Agriculture’s Western Regional Research Center in Albany, Ca. presented in the American Chemical Society’s podcast series: “Global Challenges/Chemistry Solutions.”*

Diabetes:

Harvard School of Public Health scientists estimated that replacing about two servings a week of white rice with the same amount of black rice would lower diabetes risk by 16%.

- *Archives of Internal Medicine*, June 14, 2010: 170 (11); 96-99

Insulin resistance has been strongly associated with nonalcoholic fatty liver disease. Numerous studies have suggested that natural anthocyanin are potent antioxidants associated with prevention of diabetes. “We hypothesize that black rice containing C3G may reduce the risk of hepatic fat accumulation and improve insulin resistance.”

- *Black rice (Oryza sativa L.) extract attenuates hepatic steatosis in C57BL/6J mice fed a high-fat diet via fatty acid oxidation* Hwan-Hee Jang, Mi-Young Park, et. al. “Nutrition & Metabolism” 2.89

Scientific studies using rats as subjects with dosage adjusted to human equivalency of 120mg C3G demonstrated that in eight weeks C3G inhibited lipid peroxidation (cell membrane damage leading to cell death) , improved activity of superoxide dismutase (antioxidant defense mechanism of the body) and demonstrated a hypoglycemic effect (lowering of blood sugar levels).

- Nasri; Vascular mechanisms of cyanidin-3-glucoside response in streptozotocin-diabetic rats; *Pathophysiology* (2011) 18:273-278

A clinical evaluation published in “American Journal of Clinical Nutrition” investigating the effects of consumption of major flavonoid groups concluded that anthocyanins were the only group significantly associated with a lower risk of Type II Diabetes.

- Wedick; Dietary flavonoid intakes and risk of type 2 diabetes in US men and women; *American Journal of Clinical Nutrition* (2012) 95:925-933.

GABA Rice:

The digestion of grain proteins results in many nutrients including *γ*-amino butyric acid (GABA). GABA is a neurotransmitter in the brain and spinal cord and induces tranquilizing effects. It is used as a medication to increase blood flow to the brain, to inhibit cancer-cell proliferation and provide other beneficial health effects. A purple (black) rice variety exhibited the highest GABA content of all 21 rice varieties tested. This indicates the importance of Thai black rice cultivars for adding nutritional value to functional food products.

- “*γ-Amino butyric acid (GABA) content in different varieties of brown rice during germination*” D. Karladee , S. Suriyong Department of Plant Science and Natural Resources, Faculty of Agriculture, Chiang Mai University, Purple Rice Research Unit, Institute for Science and Technology, Chiang Mai University *Science Asia* 38 (2012):13-17

Toxic Stress:

Toxins are normally released during the process of digestion. If your toxic balance is normal, the body will slowly absorb the nutrition from the food in your digestive tract. However, if your toxic level is high, the body will move food through your digestive tract at an accelerated pace in an attempt to prevent toxic overload.

In the case of patients undergoing chemotherapy the body senses toxic overload and in an attempt to prevent the system from absorbing more toxins, passes on and evacuates the food material so quickly that there is no time for absorption. In studies conducted at a Swedish Cancer Clinic and an AIDS care facility in West Hollywood, California, patients with high toxic levels who could not maintain lean muscle mass (due to the fact that food passes through their digestive track too quickly to be absorbed) responded positively to sprouted black rice powder (SBRP).

On a diet of only SBRP in purified water six times daily, cancer patients were able to maintain body weight. The high level of antioxidants in the SBRP silenced the toxic alarm at the time of digestion and the food moved at a pace which allowed absorption.

SBRP is a whole food that contains high antioxidant levels. When the SBRP begins to digest and toxins are released, the toxins are greatly reduced by the antioxidants woven throughout the protein contained in the black rice. The body does not sense a possible toxic overload, does not sound the “evacuate alarm” and the body is given time to absorb the nutrition present in the SBRP.

The antioxidants in SBRP are not only woven into the protein but are also woven into the bran and therefore travel at the same rate as peristalsis allowing them to be absorbed properly at the right time and location (location specific delivery).

SBRP was tested at a clinic in Brazil, on patients with giardia (a severe gastrointestinal parasitic infection). The objective was not to cure the giardia but to help the patients maintain lean body mass throughout the course of the infestation. The results were highly satisfactory.

Today’s modern world is filled with toxic stress and exposure to free radical imbalance from the foods we eat, stress from our fast paced lifestyle, environmental pollution etc. The benefits to the average individual in good health are demonstrated by the positive effects of sprouted black rice powder on those who are suffering from more extreme toxic stress.

Studies conducted at the Department of Food Science, Volcani Center, ARO, Israel conclude:

“High concentration of dietary antioxidants could prevent lipid oxidation and ALEs (advanced lipid oxidation end products) generation not only in foods but also in the stomach condition and thereby potentially decrease absorption of ALEs from the gut. This could explain the health benefits of diets containing large amounts of dietary antioxidants.”

“Dietary advanced lipid oxidation end products are risk factors to human health.” Mol Nutr Food Res. 2007 Sep; 51(9):1094-101

* The tests referred to at the Swedish Cancer Clinic, AIDS care facility in California, and the hospital in Brazil were not officially sanctioned scientific studies. These were part of the initial attempts by the Black Rice Project founders to discover the value of sprouted black rice powder.

Summary:

The remarkable dietary balance of black rice makes it an antioxidant rich whole food whose health benefits are only now being fully researched and understood. University and other independent studies are now in progress and the results will be reported to you in amendments and additions to this section of the sprouted black rice product brief.

The true test of its value is what it does for you. With advice from your physician, take your health destiny into your own hands. In our experience, most people who have begun to incorporate sprouted black rice powder into their daily diet enthusiastically continue to do so.

- Bran-complete (high fiber)
- Sprouted
- Fresh freeze dried
- High Protein
- Highly Nutritional
- Low in sugar
- Low Glycemic
- Antioxidant rich (all 7 Anthocyanin species)
- Natural source of C3G (assisting weight management)
- All 20 Amino Acids