Product Ingredients



Rice Bran Oil

Recommended Labeling: Rice bran oil

- Rich in γ-oryzanol, phytosterols, vitamin E.
 No oil drunkenness
- Anti-oxidizing and long-lasting taste
 Enhances the taste of ingredients
- etc.



Ferlic Acid

Labeled name: Antioxidant (ferulic acid)

Antioxidants
 Alzheimer 's disease improvement
 Hyperlipidemia improvement etc.

Natural raw materials for vanillin



Rice Germ Oil GX-N

Recommended Labeling: Rice germ oil, Rice bran oil

 Reduces cholesterol, regulates endocrine and autonomic nervous systems
 Antioxidant, UV absorption, inhibition of

tyrosinase activity • Improves blood circulation, regulates skin temperature and sebum, etc.

Rice oil with 30% γ -oryzanol residues



Riceterol Esters

Recommended labeling: Rice bran oil, rice bran extract (contains phytosterol esters)

- Pale yellow to yellow paste oil
- Unique richness
- Make mild taste of foods
 Enhances salty taste atc
- Enhances salty taste, etc.



Ricetrienol™

Recommended Labeling: Rice bran oil, Rice bran extract

Antioxidant etc.

Contains tocopherol and tocotrienol from rice bran



Rice Magnesium

Recommended Labeling: Rice Magnesium, Rice bran extract (contains magnesium phosphate)

- Cofactor for enzymes for protein synthesis
- Essential for energy production, oxidative phosphorylation and glycolysis

• Important role in DNA and RNA synthesis and skeletal development etc.



Inositol

Labeled name: Inositol

Antioxidant

- Involved in the regulation of intracellular
- trafficking Involved in regulation of cell proliferation
- Regulation of cytoskeleton
 Regulation of neuronal signaling etc.

Vitamin B-like multifunctional components

RICEO™

Recommended Labeling: Rice bran extract

Improve obesity and blood pressure
 Inhibition of lipid peroxide production

Inhibits absorption of neutral fat and

inhibits increases in blood glucose level

Contains phytic acid, rice bran protein, dietary fiber, vitamin B, GABA, etc.



Phytic Acid

Labeled name: Phytic acid, acidulant, pH adjuster

• Adenosine triphosphate (ATP), which is a

source of energy

- Composes the skeleton as hydroxyapatite
 Maintains osmotic pressure and pH balance in cells
- Chelating and antioxidant properties etc.

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Ferulic Acid

Labeled name: Antioxidant(Ferulic acid)

 CH_3

HO

Composition : Ferulic acid Standards : Japan Additives Official Standards Final processing place: Japan (Wakayama Prefecture) Raw material: Rice bran Origin: Rice (defatted rice bran) Halal, Kosher

Polyphenols from rice bran

•Antioxidants to prevent discoloration

- Brain function and weight loss supplements
- •Vanillin raw materials, etc.

Natural and powerful antioxidant material

Antioxidant

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ORAC :Oxygen Radical Absorbance Capacity



Brain function

Oral administration decreases amyloid beta in the cingulate cortex.

> AD model mice ferulic acid 30mg/kg/day

Neurite outgrowth by addition of ferulic acid to human neurons.

SH-SY5Y cells Ferulic acid 1mM added 24h culture

cell body —neurite



Ferulic acid

Control



Bumrungpert A et al. Nutrients. 2018 Jun 2;10(6):713

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48 hyperlipidemic patients (24 per group) Ferulic acid 1000 mg/day or placebo orally for 6 weeks.

	Change			
Biomarker (mg/dL)	Placebo	Ferulic acid	р	
Total cholesterol	-2.17±6.71	-8.07±4.56	0.001	
tryglicerides	-0.41±27.85	-12.12±7.95	0.049	
LDL- cholesterol	-1.69±6.72	-9.32±4.82	<0.001	

Fading contro

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Avocados were immersed in a 3% solution of ferulic acid or ascorbic acid for 20 minutes and kept refrigerated to compare their anti-browning effects.



Clinical test

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Students t-test Mean±SD(vs.0days)

Ferulic acid or placebo 300 mg/day. 27 days later, cognitive function testing with Cognitrax was performed.



Clear and energetic brain.

Rice Germ Oil GX-N

Labed name: Rice germ oil Rice bran oil

Composition: Final processing pla Raw material: Origin: Halal, Kosher

γ-Oryzanol Japan (Wakayama Prefecture Rice bran Rice (Rice bran crude oil) Rice bran oil



Indian J Med Res 139, June 2014, pp 857-863

Special oil with highly content of γ -oryzanol



Multifunctional Health Support Food Materials

Menopause

Asia-Oceania J Obstet. Gynaecol. Vol. 10, No. 3:317-323, Sep. 1984.

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Postmenopausal women were administered 300 mg of gamma-oryzanol for 4 to 8 weeks, and the degree of improvement of each symptom was investigated.



Beauty care

Skin condition was measured in 28 healthy male and female subjects taking 100 mg/day of GX-N (30 mg/day of γ -oryzanol).



Muscle strength

H₃C

Muscle strength changes were measured in healthy subjects (n=30) who received γ -oryzanol at 600 mg/day for 9 weeks and continued resistance training.



Hyperlipidemic diabetic patients (n=42) were administered 300 mg/day of γ -oryzanol and 16 weeks later, blood lipids were measured. TC: total cholesterol, HDL: good cholesterol, TG: triglycerides

*p<0.05	5, **p<0.01, *	⊧∗p<0.001	After(week)			
		before	4	8	12	16
TC	(mg/dl)	270±41	251±46*	251±49*	246±50**	238±48 **
HDL	(mg/dl)	42±13	52±17**	53±14**	57±13***	56±12***
TG	(mg/dl)	250±109	196±87*	194±113*	197±108*	173±81*

γ-oryzanol decreased TC, TG, and increased HDL

Adding Richness

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GX-N was added to whipped cream at 0.04% of the total amount, and each item was compared to whipped cream without GX-N. (n=17)



To be active and healthy

Riceterol Esters

Composition: Final processing plac Raw material: Origin: **Halal, Kosher** phytosterol ester Japan (Wakayama Prefecture) Rice bran Rice (Rice bran crude oil)

Labeled name: Rice bran oil Rice bran extract (contains phytosterol esters)





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For improved taste in plant base



·Low-sugar foods, etc.

Food Deliciousness UP Materials

Sweetness

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A statistical analysis was performed on the plant-based chocolates, using a sensory evaluation of the intensity of each item from -2 to +2 points when the control product was used as the reference.

	Control	Test
Chocolate (dairy-free)	100	99
RSE	-	1

Increased sweetness Decreased bitterness Increased creaminess → Increased milkiness



Enhance saltiness

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Using the VAS questionnaire, the salty intensity of the samples with RSE was evaluated on a 10-cm scale, with the criterion set at 5 cm and 7 cm for the salty intensity of the 0.9% and 1.0% salt without RSE.(n = 9).

Emulsion sample composition	(%)	7 Salt
water	Up to 100	6 E Salt
salt	0.8~1.0	, ssan
sucrose stearate	1	f salti °
glyceryl monostearate	1	o 2 .
Rice oil	30 or 25	trongi 1
RSE	0 or 5	νοι t



Fullness and Body

Statistical analysis was performed on the test product (egg, milk, and wheat-free) by sensory evaluation of the intensity of each item on a scale of -3 to +3 points, with the control product used as the reference.

	Control	Test RSE
Unadjusted soy milk	26	26
Cider vinegar	0.5	0.5
Coconuts oil	60	60
Salt	0.5	0.5
Rice oil	13	12
RSE	-	1



Improved mouthfeel \rightarrow buttery feel

Flavor enhance

RSE(-)

RSE5%

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A questionnaire on aroma (5-point scale from -2 to +2) was administered for tube seasonings with/without 1% RSE.

Enhanced aroma aftertaste and aroma intensity



Enhance mechanism

Oil droplet size of emulsified samples with/without RSE under microscope

The addition of RSE reduced oil droplet size and made it easier for taste substances to contact taste cells

=Taste is more easily perceived.



Adding values to plant-based

Rice Magnesium

Origin:

What is "Moodfood"?

that have a positive emotional impact

e.g.)

Mood×Food

Mg from plant

Plant-derived

Magnesium

Mental health

Labeled name: **Rice bran extract Rice magnesium**





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Absorption

Volunteers (n=5) were given magnesium oxide or rice magnesium. Blood magnesium levels were measured 3 hours later.



Parameters

Sleeping time

Sleep latency

Blood magnesium

concentration

Blood melatonin

concentration

<u>Sleep</u> care

Subject

Magnesium

Placebo

Adults 65-75 years

500 mg/day for 8 wk

(43 participants)

Intervention

Behnood Abbasi., *et al.*, J Res Med Sci. 2012 Dec;17(12):1161-9.

Magnesium

12 (5.2, 18.9)^{a,b}

-14

(-30.8, 2.7) a,b

4.2 (-0.2, 8.5)

35

(10.5, 59.5) a,b

a: $\rho < 0.05$, vs initial value, b: $\rho < 0.05$, vs Placebo

Change from initial value

Placebo

-0.27 (-2.7, 2.2)

3.7 (-1.0, 8.4)

-1.3 (-5.5, 2.9)

-1.1

(-23.6, 21.3)



-5 -10 -15 -20 -25

Placebo

Magnesium Placebo P = 0.02

Charles James Steward., *et al.*, Eur J Appl Physiol. 2019 Dec;119(11-12):2617-2627.

Stress relief Relaxation

Afsaneh Rajizadeh., *et al.*, Nutrition 2017; 35: 56–60.

Sleep quality etc.

Muscle care

Subjects Male(n=9)

Intervention Magnesium Placebo 500mg/day 10 km run after 7 days of intake Crossover test

> Pre; before running Post; after running



magnesium and placebo

Anti-caking

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Chillax

Inositol

Labed name: Inositol

Origin

Unipolar depression

4wk

2012;166(4):703-710

•Women ······· Bipolar depression

4wk 0wk

Donà G, Sabbadin C, et al., Eur J Endocrinol.

Totally Support for Life



for Depression (HAM-D) General assessment of depression symptoms



PCOS patients were given 1200 mg inositol (n=18) or placebo (n=8) for 12 weeks and diabetes-related parameters were measured before and after the study. PCOS (Polycystic ovarian syndrome) disease caused by hormone imbalance

0

0wk



Metabolic syndrome

Subjects with hyperlipidemia (n=17) were given 5 g of inositol per day for one week, followed by 10 g of inositol per day for one week. Blood lipidrelated parameters were measured before and after the study.

n9/dL

Error Count (Ave)





sport

60 healthy male and female subjects ingested one packet per day of a supplement containing inositol for 7 days. Brain function tests were conducted.

Trail Making Test A descriptive test that comprehensively measures extensive attention, working memory, spatial exploration, processing speed, persistence, and impulsivity

Fertility(left:women/right:men)

34 women with PCOS received folic acid 200 µg or folic acid 200 µg + inositol 2 g twice/day for 3 months.



Jaime L. Tartar et al., Nutrients 11(2019) 2326.

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Rvota Maeba, et al., J

Nutr Sci Vitaminol, 54, (2008) 196-202



J Matern *et al.,* Fetal Neonatal Med. 2013 Jul;26(10):967-72 A.E. Calogero *et al.*, Andrology, 2015 May;3(3):491-5

194 infertile patients under 45 years of age folic acid 400 μ g or folic acid $400 \mu g$ + inositol 4 g once/day for 3 months.



Support for your entire life

anite 14 14 13 14 FT 41 FT 41 FT AN

Phytic Acid

Protecting the taste

with nature power.

Labeled name: Phytic acid, Acidifier, pH adjuster



Chelating



Phyti

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Organic Acid Addition(g/kg)

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Phytic acid can adjust pH in small amounts

Discoloration

Change over time after 10 min immersion in each aqueous solution. Phytic acid 0.5% (pH 1.57) Deionized water (pH 5.78)



24 hr



<u>Wade method</u> Add each organic acid to Wade reagent (0.3% sulfosalicylic acid + 0.03% ferric chloride) and measure the color change of the reagent due to chelation of Fe.



The power of nature protects deliciousness.

PH adjustment

·Chelating power Antioxidant etc.

pH Adjustment

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5% sucrose /0.5% salt was prepared and the amount of each organic acid added was measured. 5.0



Amount of organic acid added (g/kg)

Fading

Prevents fading of vegetables and fruits.



Red shiso solution adjusted to pH 4.0 with each acid, then irradiated with light at 13,000 lux for 5 days

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Adjustment bН

- Collagen requires a large amount of organic acid for pH adjustment. (about 10 times the general amount) Addition of large amounts
- of organic acids may cause $\frac{1}{4.0}$ excessive acidity.



3.0

Immersed in 0% and 1% phytic acid solution for 1 hr, dehydrated, stored at 4°C, and observed after 4 days.

RICEO-EX

Labed name : Rice bran extract

xtract			
Composition/100g			
Protein	8.2 g	VB1	7.2 mg
Dietary fiber	11.1 g	VB2	0.6 mg
Phytic acid	27.8 g	VB6	10.2 mg
Mg	2.7 g	GABA	237 mg
Ca	121.0 mg	%Reference analysis	



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Rice bran Water extract powder

·Anti-Fading

- Inhibition Plasma TG Elevation
- after Eating Suppression of blood glucose
- elevation etc.

Rice bran-derived water-soluble powder

Vascular function

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Triglycerides

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Plasma TG level Paired t-test, MEAN±SD, n=8 Subject High-fat diet +1g RICEO High-Volunteers (8people) 140 fat diet Intervention 120 High-fat diet Inhibition of d TG concentration (mg/dL, vs 0h) 100 Plasma TG Elevation after High-fat diet + 1g RICEO 80 Fating 60 40 Blood 20 2 4 time(h)

Fading control

Green vegetables (broccoli, frozen) were boiled at 90°C for 2 min, then cooled under running water. After immersion in water or RICEO 0.2% solution for 30 minutes, the vegetables were stored at 10°C, 700lux for 24 hours. Colors were photographed and compared after storage



green vegetables

Subjects

Model cells for fat

accumulation(3T3L-1)

Lux : Light intensity. Unit of illuminance. 0.3 lux = brightness of a full moon.

24h, 700lux 0h Control



Intervention t accumulation te (%) Incubate for several days after adding **RICEO** Stain and quantify accumulated lipids



Blood sugar leve



Intervention Sugar solution Sugar solution+ 1g RICEO





STAR . 10 650

Rice bran Introduce Complete Energy into Our life

e gene expression (*X/GAPDH*) model cells(HUVEC)

Intervention Incubated for 24 hours Ś after addition of RICEO lati Vascular Function Gene Expression Analysis Sel (NOS, COX1)

Subjects

Vascular endothelial