



Indian Rice Bran Oil Sector

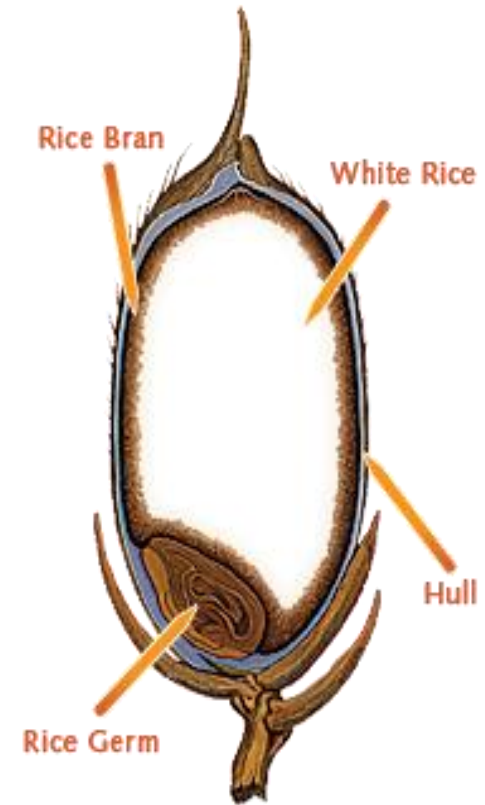
Dr. A.R. Sharma,

*Chairman,
Ricela Health Foods Limited,
India.*



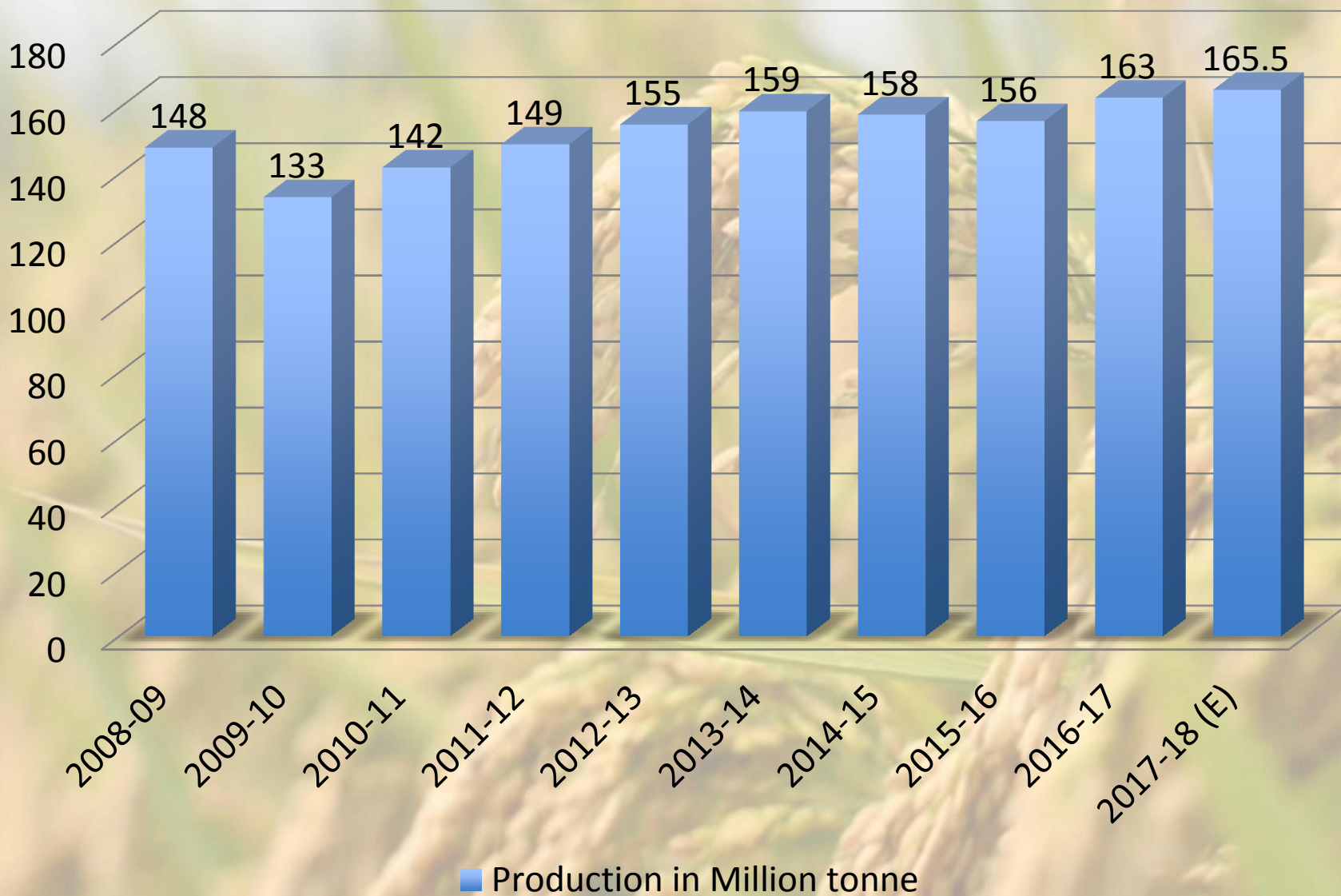
Rice Bran Oil

Rice Bran Oil is a vegetable oil produced from Rice Bran, a by-product of the rice milling industry.





India's Paddy Production





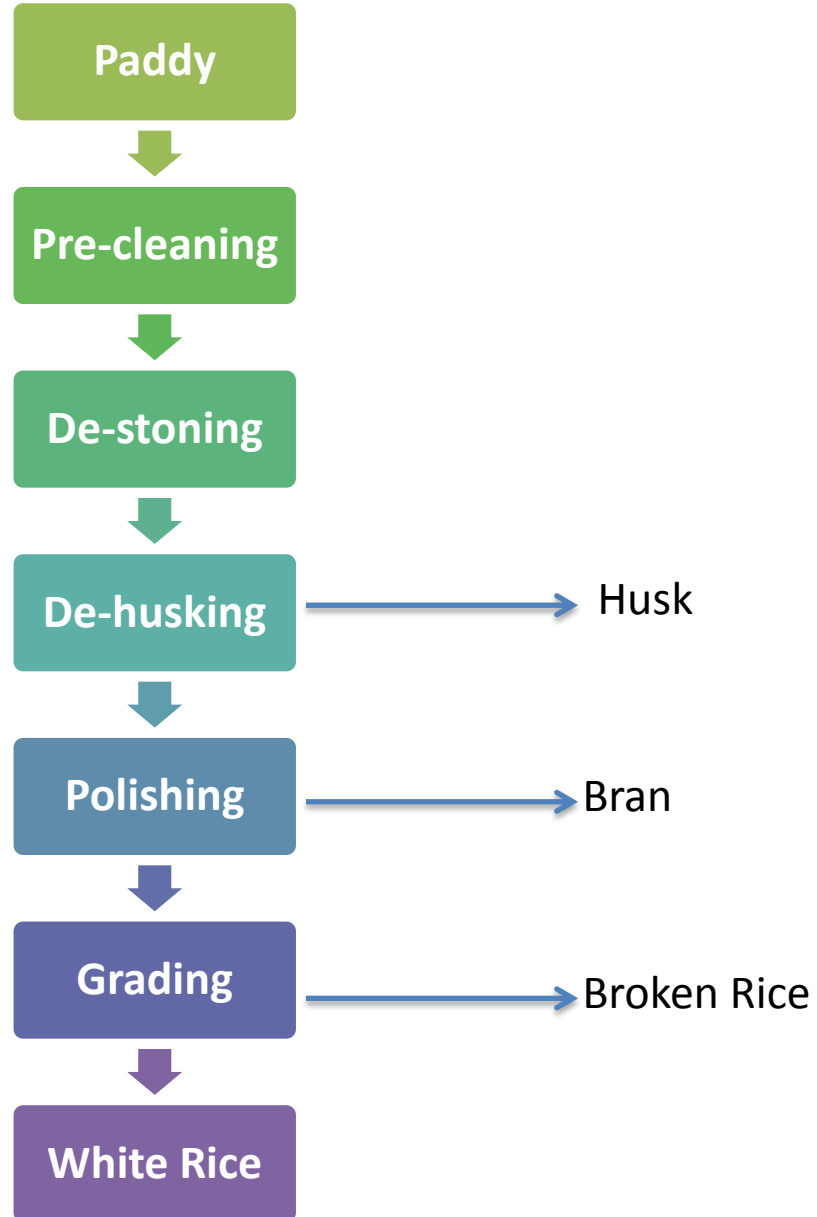
Rice Milling Technologies in India

Raw Rice Milling

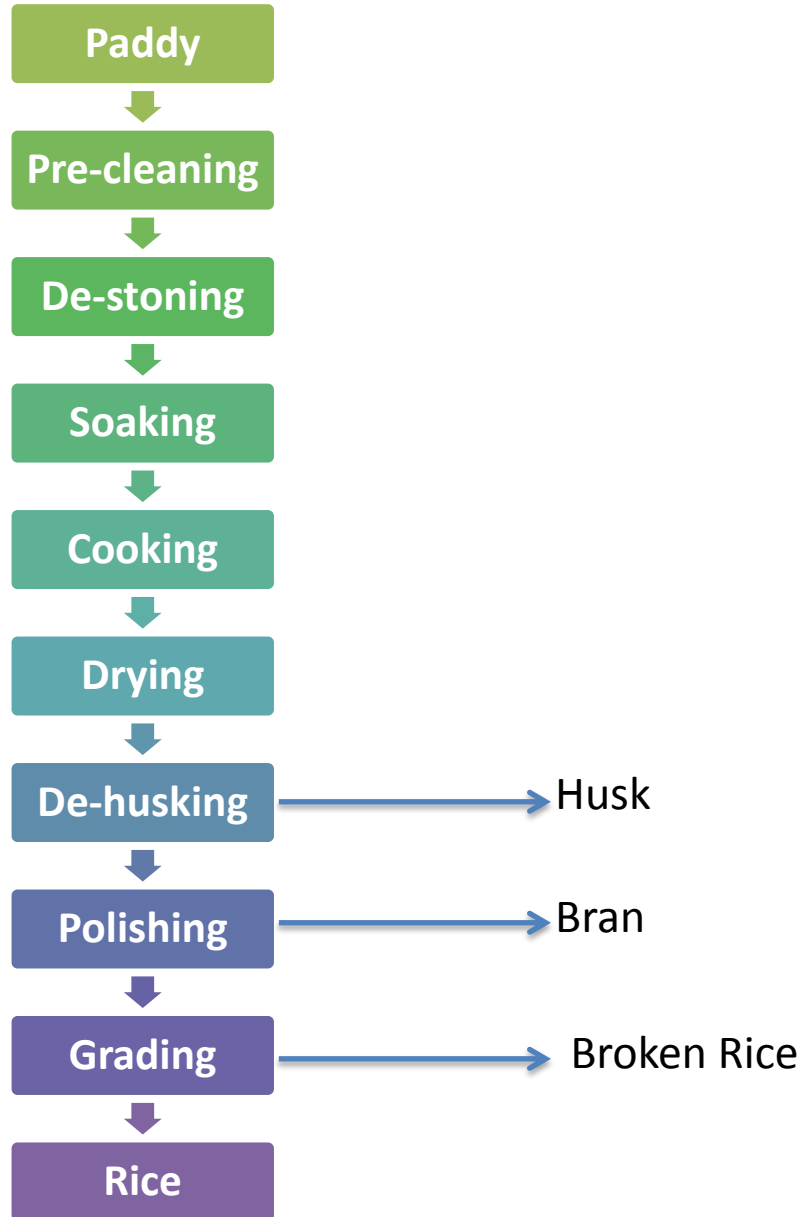
Parboiled Rice Milling



RAW RICE MILLING PROCESS



PARBOILED RICE MILLING PROCESS





Conventional use of Rice Bran

Poultry Feed



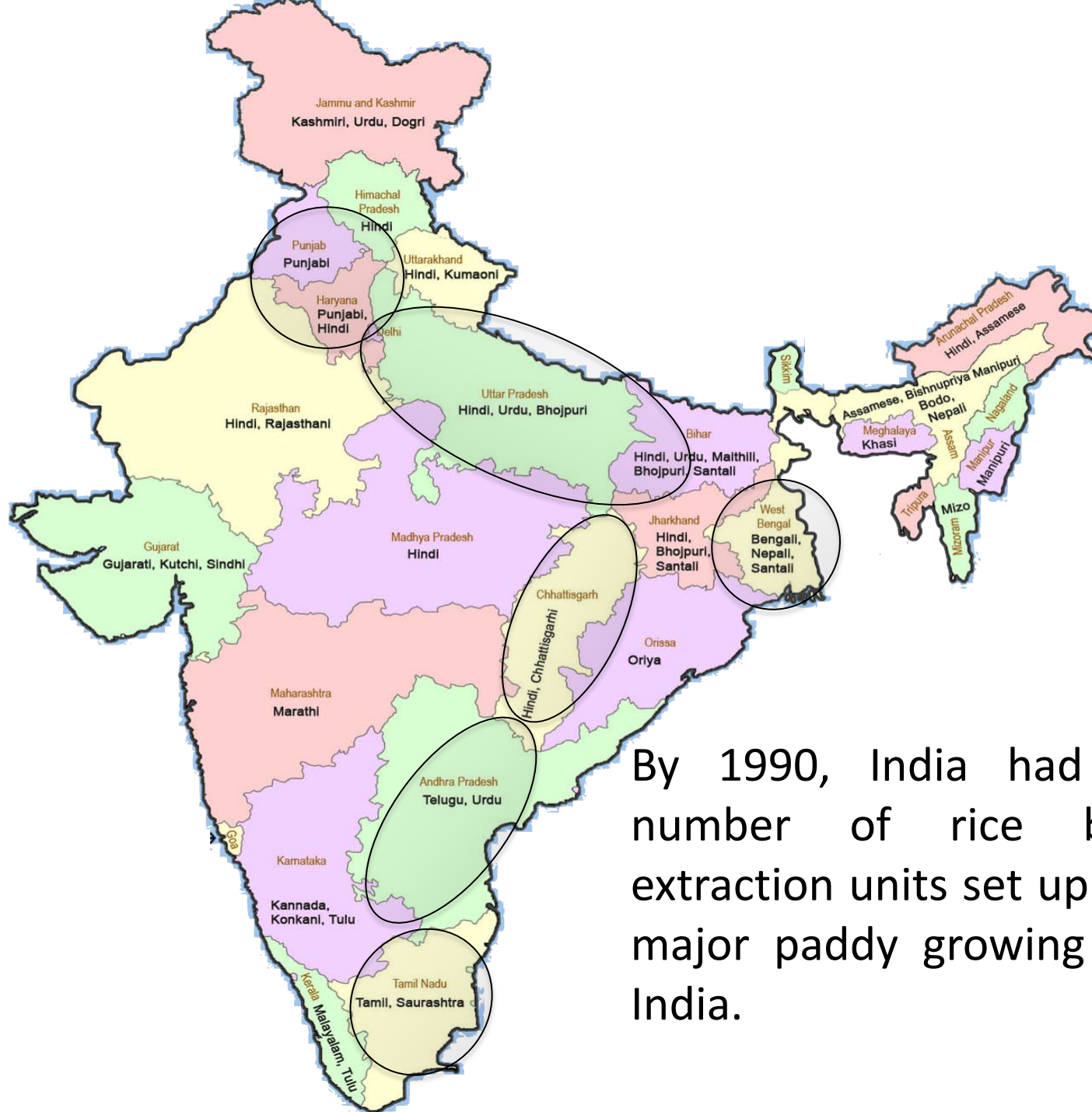
Cattle Feed





The First Rice Bran Oil extraction plant in India was set up in the year 1964 in the state of Andhra Pradesh.





By 1990, India had a large number of rice bran oil extraction units set up in all the major paddy growing areas of India.

Conventional use of Rice Bran Oil





Use of Rice Bran Oil produced from parboiled Rice Bran since 1980s

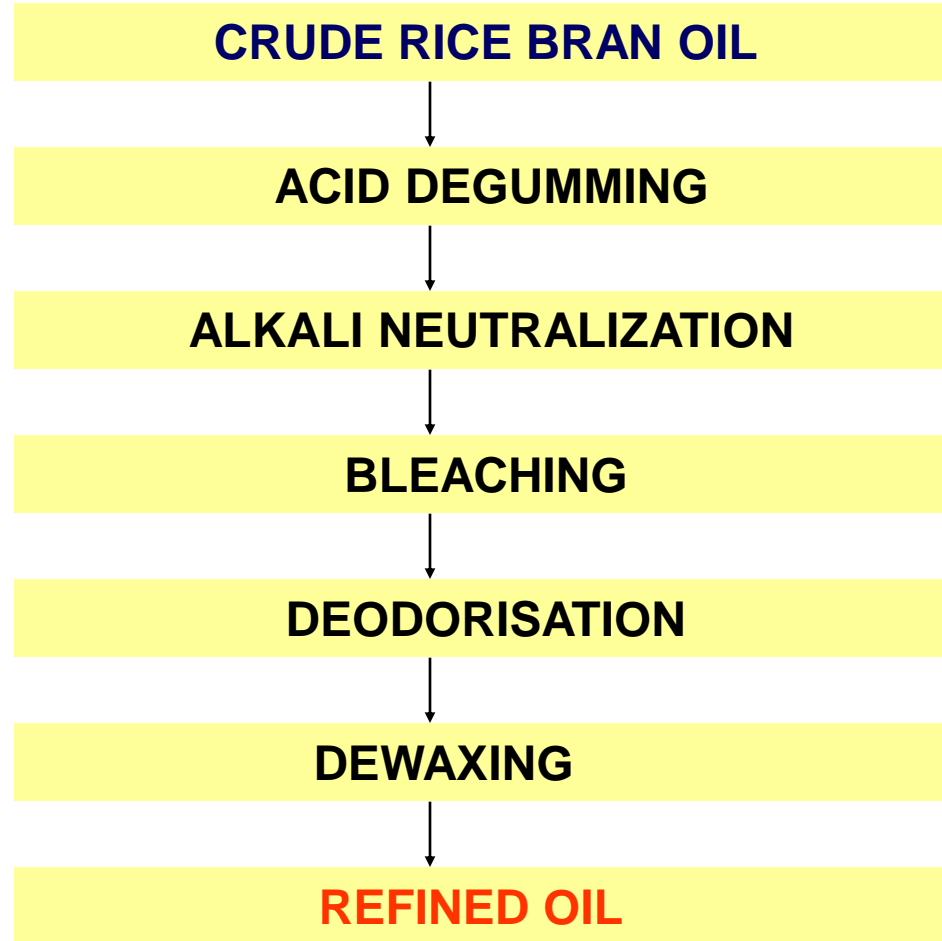
- Used as product mix in hydrogenated vegetable oil, commonly known as 'vanaspati' in India.



Early 1990s



Chemical Refining of Rice Bran Oil produced from parboiled Rice Bran





DRAWBACKS OF CHEMICAL REFINING PROCESS

- High pollution
- Higher Refining losses
- **Loss of “Oryzanol” - a unique nutrient present in Rice Bran Oil**



International research
presents Oryzanol as
a wonder nutrient

- A recent human Clinical Study conducted by Indian Council of Medical Research has found that the blend of Rice Bran Oil and Sesame Oil in the ratio of 80:20 to be really effective in reducing Hypertension. The researchers believe this effect is mainly due to antioxidants present in the Sesame Oil and Oryzanol in Rice Bran Oil.

Source:- A Hindustan Times Newspaper report published on 23rd September, 2012





Helpful in Blood Sugar Management

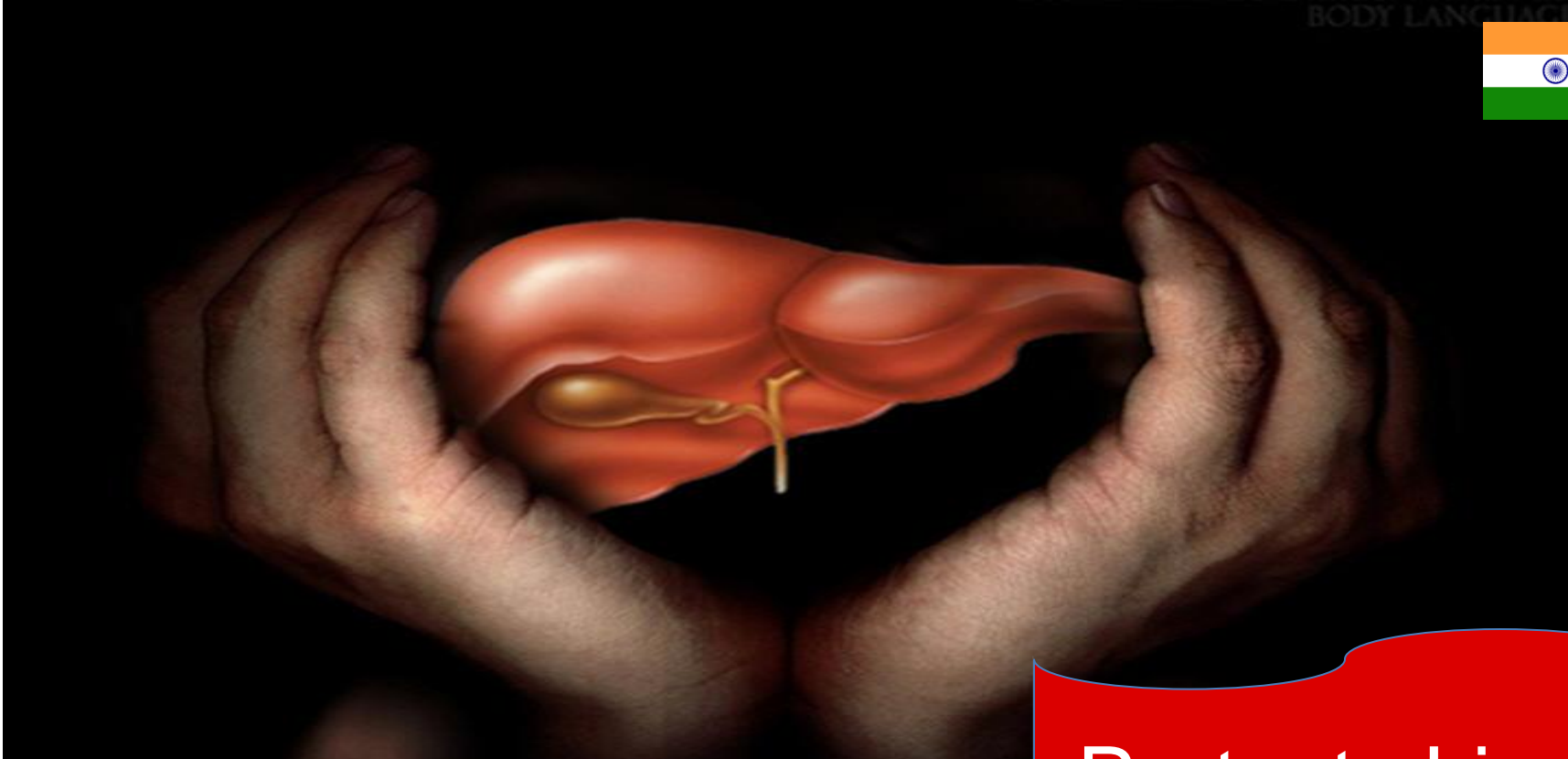


- A study conducted in Taiwan found out that Rice Bran Oil, containing Oryzanol, may improve lipid abnormalities, reduce the atherogenic index, and suppress the hyperinsulinemic response in rats with streptozotocin/nicotinamide-induced T2DM.

Source:- Journal of Clinical Biochemistry and Nutrition, Japan, 45, 29-36, July 2009

- In a study conducted by Nirma University India, Oryzanol has been found to have protective effect on hyperalgesia and oxidative stress which might be responsible for diabetes induced nerve damage or the disease called Diabetes Neuropathy.

Source:- Brazilian Journal of Pharmacognosy [online], 2012, 1092-1103. Epub Sep 06, 2012.



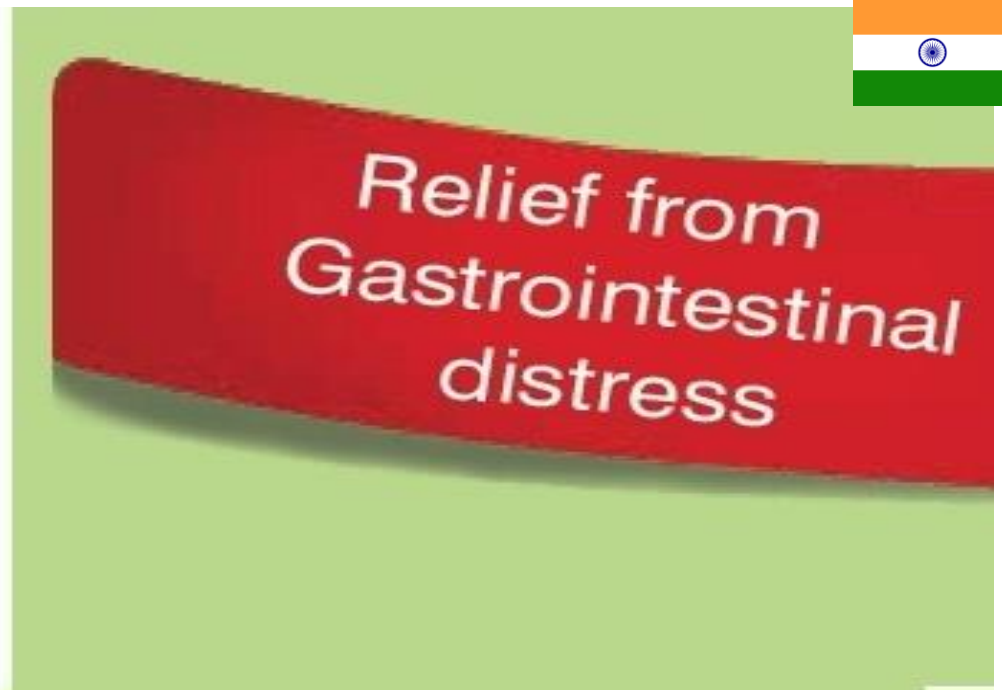
Protects Liver

- Studies conducted by Nagasaki University, Japan suggest that Y-Oryzanol is very effective against liver cirrhosis. Studies have attributed this to the effective antioxidant property of Oryzanol.

Source:- Journal of Clinical Biochemistry and Nutrition, Japan, 12, 193-199, 1992

- A study by Tokyo University, Japan revealed that Oryzanol has a protective effect against alcohol-induced liver damage. It inhibited the oxidative stress which is a prime reason for liver damage.

Source:- C. Chotimarkorn, H. Ushio Phytomedicine 15 (2008) 951-958



- A study in Japan found out that an 8-day treatment with gamma-oryzanol showed a significant inhibition of fasting ulcer and a 10-day treatment with the same dose of gamma-oryzanol in acetic acid ulcers lowered the serum level of gastrin.

Source:- Journal of Folia Pharmacologica Japonica 1976 Nov;72(8):1001-11

- Another study in Japan reported that the oryzanol is effective against the stress induced ulcers.

Source:- Journal of Folia Pharmacologica Japonica 1976 May; 72(4):475-81



Anti-inflammatory

- A study by Department of Food Science and Technology, Tokyo found that treatment with Oryzanol during the entire time course of treatment of colitis (swelling of the Intestine), suppressed the pathological conditions, including body weight loss, intestinal bleeding and diarrhoea, resulting in significant amelioration of intestinal inflammation.

Source:- British Journal of Pharmacology (2008) 154, 812-824

- A study conducted by Department of Pharmaceutical Sciences, Thailand yet again confirmed the anti inflammatory properties of Oryzanol.

Source:- Journal of Medicinal Plant Research Vol.6(6), pp. 1070-1077, 16 February, 2012



- Clinical trials involving menopausal women, have revealed that 67-85 percent of women treated with gamma-oryzanol have experienced a significant reduction in menopausal symptoms.

Source:- A Research Article taken from http://www.meschinohealth.com/ArticleDirectory/Gamma-Oryzanol_Menopause_Treatment

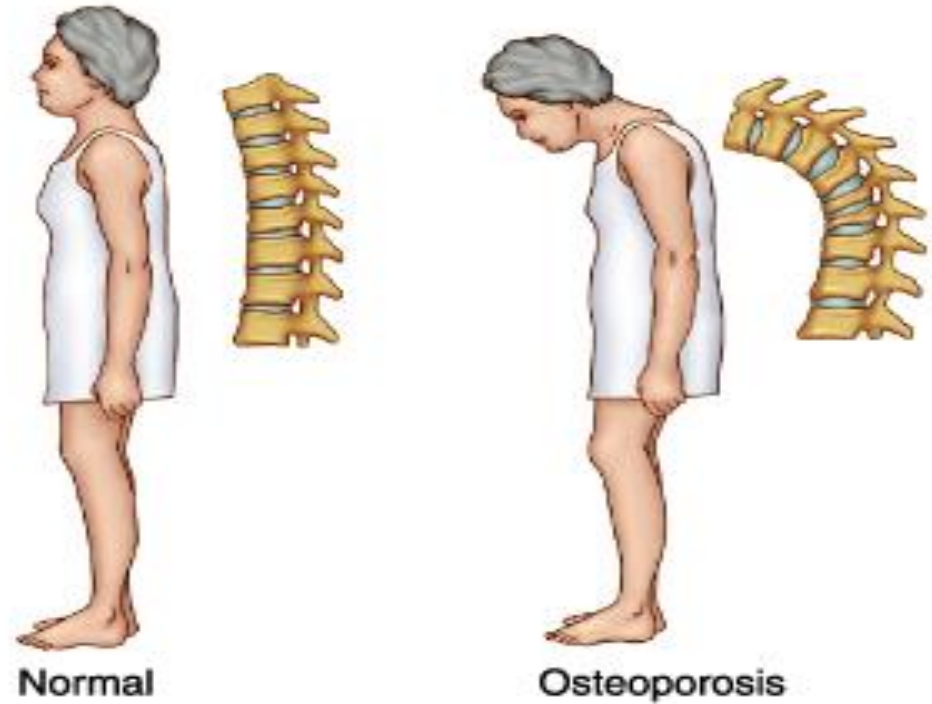


Treats menopausal symptoms



- A study conducted on Ovariectomized rats (who typically lose substantial bone mineral density after the ovariectomy) were used as a model for postmenopausal osteoporosis. It was found that the addition of a 7% oryzanol rice bran oil (RBO) concentrate to the diets of ovariectomized rats resulted in less bone loss at several bone sites than control rats.

Source:- A thesis submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College



Helps patients of Osteoporosis



- A study in Chiang Mai University, Thailand has found Oryzanol as a potential cosmetic raw-material. According to the study, Oryzanol helps in skin whitening, skin hydration and is anti ageing.

Source:- Journal of Pharmaceutical Biology, Thailand 2012 Feb;50(2):208-24

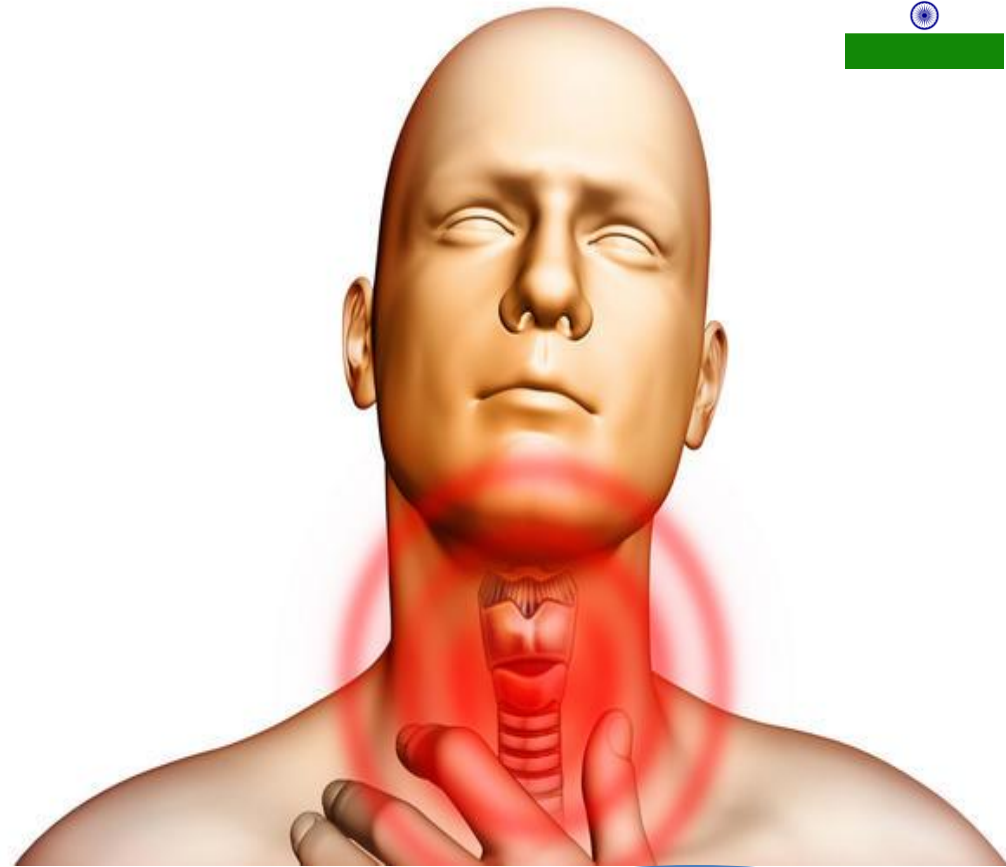
- Oryzanol, due to its antioxidant property, is an effective Sunscreen and thus protects the skin from U-V Rays.






- A study conducted in Japan has found a single oral dose (300 mg) of gamma-oryzanol extracted from rice-bran oil to be effective, in significantly reducing elevated serum TSH levels in hypothyroid patients.

Source:- Journal of Endocrinologia Japonica, Japan 1980 Feb 27(1):83-86



Helpful for patients
of Hypothyroid

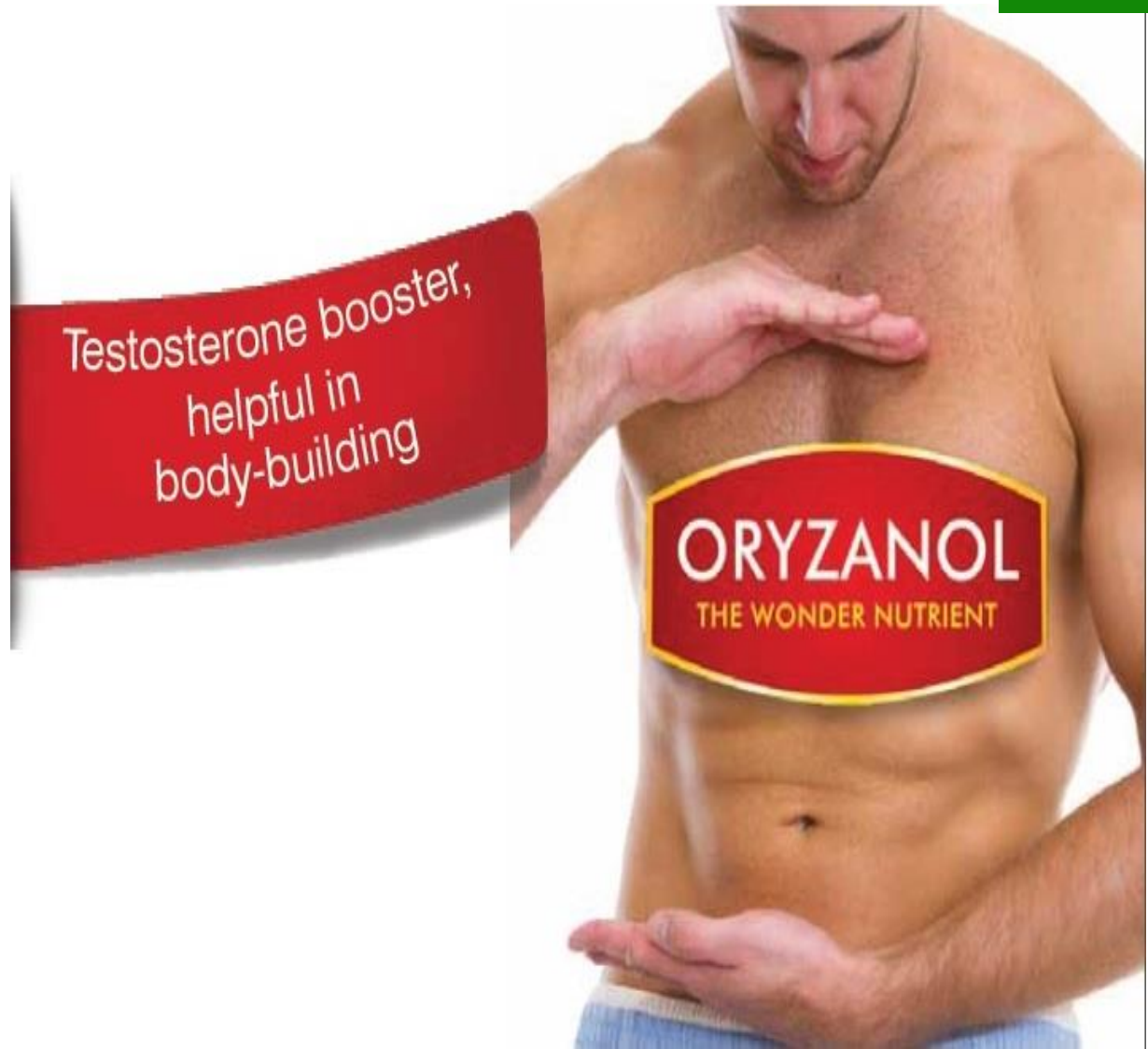
- 
- Several studies have shown gamma oryzanol to be as effective as many drugs in reducing objective, systematic effects of stress.
 - A joint study by the University of Kentucky, USA and University of Catania, Italy has revealed that Oryzanol (which is a Ferulic Acid Ethyl Ester) has therapeutic ability to protect body from oxidative stress-related neurodegenerative disorders like Alzheimer.

Source:- Journal of Neurochemistry International 48 (2006) 318-327



Neuro-Protective

- An unpublished study by Bucci, L., Stiles, J., Sparks, W., and DeLuca, D., 1987, compared anabolic steroid users to those athletes supplemented with gamma oryzanol. Initially, the anabolic steroid users showed greater gains in girth measurements, but by 16 weeks, the gamma oryzanol users exhibited greater girth measurement increases than all steroid users, without ANY side effects! And the dose of gamma oryzanol is low.
- These findings have created an interest in using Y-oryzanol as a sports supplement. Companies in U.S. are selling Oryzanol based Health Supplements for Body building.





a.) A scientific study conducted by Tufts University, Boston and University of Massachusetts Lowell, USA has revealed that oryzanol helps in lowering (significantly) hbad cholesterol and increasing good cholesterol at the same time.

Source:- *Lipids, Vol.32, no. 3,(1997) 303-309,USA*

(Journal of American Heart Association)

1994;14:549-556, Artherosclerosis, volume

88, Issues 2-3, June 1991, pages 133-142

b.) Human Clinical Study conducted in University of Lowell found that Rice Bran oil has significantly better cholesterol lowering properties than popular Olive Oil. Scientists have attributed this to presence of Oryzanol in the oil.

Source:- *Arterioscler Thromb Vasc Biol.*

Clinical trials conducted in Japan have shown that 300 mg per day is the effective dosage of Oryzanol





Study Component	Daily Dosage	Study Design (Study Duration)	Number of Subjects	Pharmacological effect	Ref.
Oryzanol	300 mg	RCT*(8 weeks)	40 Post-menopausal women	↓TC, LDL-C, TG, Lipid peroxides, ↑ HDL-C	Ishihara M, Ito , Nakakita T, Maehama T, Hieda S, Yamamoto K and Ueno N
					Nippon Sanka Fujinka Gokkai Zasshi, 34 (1982) 243-251
	300 mg	RCT*(13 weeks)	80 Hyper-cholesterolemics	↓TC, LDL-C, TG,	Yoshino G, Kazumi T, Amano M, Tateiwa M, Yama- saki T, Takashima S, Iwai M, Hatanaka H & Baba S, Curr Ther Res, 45 (1989) 975
	300 mg	RCT*(8 weeks)	20 Hyper-cholesterolemics	↓TC, LDL-C, TG, Apolipoprotein B,	Sasaki J, Takada Y & Handa K 1990 Clin Therap, 12 (1990) 263- 268
	300 mg	RCT*(8 weeks)	8 Hypo- thyroid Patients	↓TSH	Shimomura Y, Kobayashi I, Maruto S, Ohshima K, Mori M, Kamio N, Fukuda Endocrinologia Japonica [1980, 27(1):83-86]



Mid 1990s

Development of Physical Refining Process in India

 INTELLECTUAL
PROPERTY INDIA
PATENTS | DESIGNS | TRADEMARK
GEOGRAPHICAL INDICATIONS


GOVERNMENT OF INDIA
THE PATENT OFFICE
PATENT

(Rule-74) Del-06/0470

No.194862 of 12/01/01

WHEREAS ACHHRU RAM SHARMA, an Indian National of A.P. Enclave, Sangrur Bypass Road, Dhuri, Distt. Sangrur, Punjab, India

has/have declared that he is/they are in possession of an invention A PROCESS FOR THE PRODUCTION OF REFINED RICE BRAN OIL


and that he is/they are the true and first inventor(s) thereof (or the legal representative(s) or assignee(s) of the true and the first inventor(s)) and that he is/they are entitled to a patent for the said invention, having regard to the provisions of the Patents Act, 1970, as amended and that there is no objection to the grant of a patent to him/them.

And whereas he has/they have, by an application, requested that a patent may be granted to him/them for the said invention;

And whereas he has/they have by and in his/their complete specification particularly described the said invention and the manner in which the same is to be performed;

Now, these present(s) that the above-said applicant(s) (including his/their legal representative(s) and assignee(s) or any of them) shall, subject to the provisions of the Patents Act, 1970, as amended and the conditions specified in Section 47 of the said Act, and to the conditions and provisions specified by any other law for the time being in force, has/have the exclusive right to prevent third parties from making, using, offering for sale, selling or importing for those purposes the product in India/ using the process and using, offering for sale, selling or importing for those purposes the product obtained, if any, directly by that process in India, for a term of twenty years from the Twelfth day of January, Two thousand and one and of authorizing any other person to do so, subject to the conditions that the validity of this patent is not guaranteed and that the fee prescribed for the continuance of this patent is duly paid.

In witness thereof, the Controller has caused this patent to be granted as of the Twelfth day of January, Two thousand and one


Controller of Patents

Date of Grant : 17/03/06 - 26th Phalguna, 1927 (Saka)



Since 1998 The Solvent Extractors' Association of India, jointly with Technology Mission on Oilseeds & Pulses and Council for Scientific & Industrial Research, Govt. of India launched campaign to encourage production and use of Rice Bran Oil as a 'Healthy Cooking Medium'.



Technology
Mission on
Oilseeds &
Pulses





In the year 2001, Government of India sponsored Research and Development for developing cost-effective pre-treatment technologies for Physical Refining of Rice Bran Oil

- The National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram (formerly known as the Regional Research Laboratory) developed a pre-treatment process of simultaneous degumming and dewaxing



CSIR – National Institute for Interdisciplinary Science and Technology (NIIST)

Council of Scientific & Industrial Research (CSIR), Govt. Of India
Thiruvananthapuram.



- Indian Institute of Chemical Technology, Hyderabad developed enzymatic degumming process



CSIR-IICT

CSIR-Indian Institute of Chemical Technology

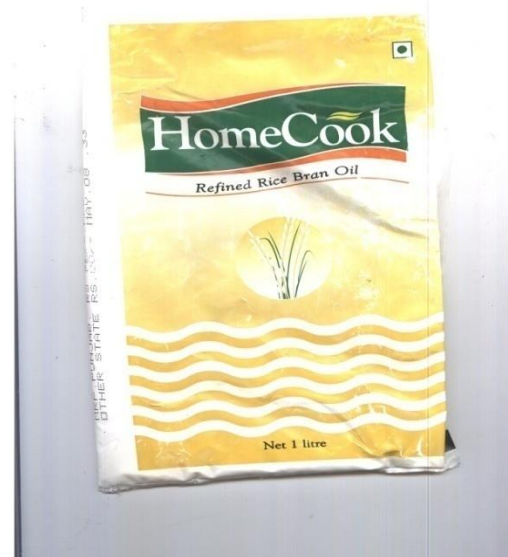


Government of India



A number of Units were set up in the recent past throughout India, based upon technologies developed by National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram (formerly known as the Regional Research Laboratory) & Indian Institute of Chemical Technology, Hyderabad with the grant- in-aid assistance from the Government of India.

INTRODUCTION OF REGIONAL BRANDS OF RICE BRAN OIL IN INDIAN MARKET





Introduction of Blends of Rice Bran Oil in Indian Market



AMENDMENT OF FOOD STANDARDS OF REFINED RICE BRAN OIL IN THE YEAR 2008



Unsap Matter raised from 3.5% to 4.5% to maintain Oryzanol

2

THE GAZETTE OF INDIA : EXTRAORDINARY

[PART II—SEC. 3(i)]

टिप्पण : खाद्य अपमिश्रण निवारण नियम, 1955, भारत के राजपत्र, भाग II, खंड 3 में सं. का.नि.आ. 2106 तारीख 12 सितम्बर, 1955 द्वारा प्रकाशित किए गए थे और अंतिम संशोधन अधिसूचना सं. सा.का.नि. 664(अ), तारीख 19-9-2008 द्वारा किया गया था।

MINISTRY OF HEALTH AND FAMILY WELFARE

(Department of Health)

NOTIFICATION

New Delhi, the 27th October, 2008

G.S.R. 754(E).—Whereas a draft notification of certain rules further to amend the Prevention of Food Adulteration Rules, 1955, was published, under sub-section (1) of Section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954), *vide* notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health), number G.S.R. 106(E) dated the 25th February, 2008, inviting objections and suggestions from all persons likely to be affected thereby till the expiry of a period of thirty days from the date on which the copies of the Official Gazette containing the said notification, were made available to the public ;

And whereas, the copies of the said notification were made available to the public on the 27th February, 2008 ;

And whereas, objections and suggestions received from the public within the specified period on the said draft rules have been considered by the Central Government ;

Now therefore, in exercise of the powers conferred by Section 23 of the Prevention of Food Adulteration Act, 1954, the Central Government, after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely :—

1. (1) These rules may be called the Prevention of Food Adulteration (Sixth Amendment) Rules, 2008.
- (2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Prevention of Food Adulteration Rules, 1955, in Appendix B, in item A. 17.23 relating to Rice Bran Oil, for the words and figures “(vi) Unsaponifiable matter, per cent by weight Not more than 3.5.”, the following shall be substituted, namely :—

“(vi) Unsaponifiable matter, per cent by weight —

(a) for chemically refined—Not more than 3.5.

(b) for physically refined—Not more than 4.5.

Oryzanol content—Not less than 1.0.”

[F. No. P. 15014/28/2007-PH (Food)]

DEBASISH PANDA, Jt. Secy.

Note : The Prevention of Food Adulteration Rules, 1955 were published in the Gazette of India, *vide* notification number S.R.O. 2106, dated the 12th September, 1955 and were lastly amended *vide* notification number G.S.R. 664(E) dated 19-9-2008.



Introduction of National Level Brands of Rice Bran Oil in Indian Market in recent years





Dated, the 25th May, 2016

ORDER

Subject: Manuals of methods of analysis of various food products – reg.

Since the formation of FSSAI, the DGHS manuals of test methods for analysis of the various food products, which were prepared 20 years back were being used. Since then, a lot of developments have taken place in the analytical field and it became essential to review the manuals on methods of analysis of food articles incorporating new methods of analysis and the advancement that has taken in the analytical field. The first phase of reviewing these manuals has since been concluded and following 9 manuals of methods of analysis of foods have been approved by the Food Authority recently after a series of meetings of the Scientific Panel, Scientific Committee and Food Authority and public consultation:

- (i) Milk and Milk Products
- (ii) Oils and fats
- (iii) Fruit and Vegetable Products
- (iv) Cereal and Cereal Products
- (v) Food Additives
- (vi) Mycotoxins
- (vii) Spices and condiments
- (viii) Metals
- (ix) General Guideline on Sampling

2. The above manuals shall be termed henceforth as FSSAI manuals of methods of analysis and shall be used by the laboratories with immediate effect. The process of updation of test methods is dynamic due to new developments taking place from time to time in the field of food testing. Queries, if any, may be forwarded to email: labs@fssai.gov.in


(R.K. Gupta)
Head (QA)

Ph: 011-23220990

When testing rice bran oil based blended oils or oils or fats, which give dark colored soap solution, the observation of the end point of the titration may be facilitated, by using Alkali Blue 6B in place of Phenolphthalein.



Notification No 17 /2015-20
New Delhi, Dated : 6 August, 2015

Subject: Amendment in export policy of edible oils.

S.O.(E) In exercise of the powers conferred by Section 5 of the Foreign Trade (Development & Regulation) Act, 1992 (No.22 of 1992), as amended, read with Para 1.02 of the Foreign Trade Policy, 2015-20, the Central Government hereby amends, with immediate effect, Notification No 22(RE-2013)/2009-14 dated 18.06.2013 read with Notification No 108(RE-2013)/2009-14 dated 06.02.2015 relating to Sl. No. 92 of Schedule 2 of ITC(HS) Classification of Export & Import Items.

2. Export of edible oils was initially prohibited for a period of one year with effect from 17.03.2008 vide Notification No. 85 dated 17.03.2008 which was extended from time to time. Vide Notification No. 24(RE-2012)/2009-14 dated 19th October 2012, prohibition on export of edible oil has been extended till further orders.

3. Following exemptions are permitted from the prohibition on export of edible oils:

- (a) Castor oil
- (b) Coconut oil from all EDI Ports and through all Land Custom Stations (LCS) on Indo-Nepal, Indo-Bangladesh, Indo-Bhutan and Indo-Pakistan borders.
- (c) Deemed export of edible oils (as input raw material) from DTA to 100% EOUs for production of non-edible goods to be exported
- (d) Edible oils from Domestic Tariff Area (DTA) to Special Economic Zones (SEZs) to be consumed by SEZ units for manufacture of processed food products, subject to applicable value addition norms
- (e) Edible oils produced out of minor forest produce, ITC(HS) Code 15159010, 15159020, 15159030, 15159040, 15179010 and 15219020.
- (f) Organic edible oils subject to export contracts being registered and certified as 'Organic' by Agricultural & Processed Food Products Export Development Authority (APEDA).
- (g) Rice Bran oil in bulk.

4. Export of edible oils in branded consumer packs of upto 5 Kgs is permitted with a Minimum Export Price of USD 900 per MT.

5. The prohibition will not apply to export of Peanut Butter, ITC (HS) Code 15179020. [This already stands notified at Sl. No. 10 of the Table in Para 1 of Notification No. 31(RE-2012)/2009-14 dated 4th February, 2013]

6. Effect of this notification:

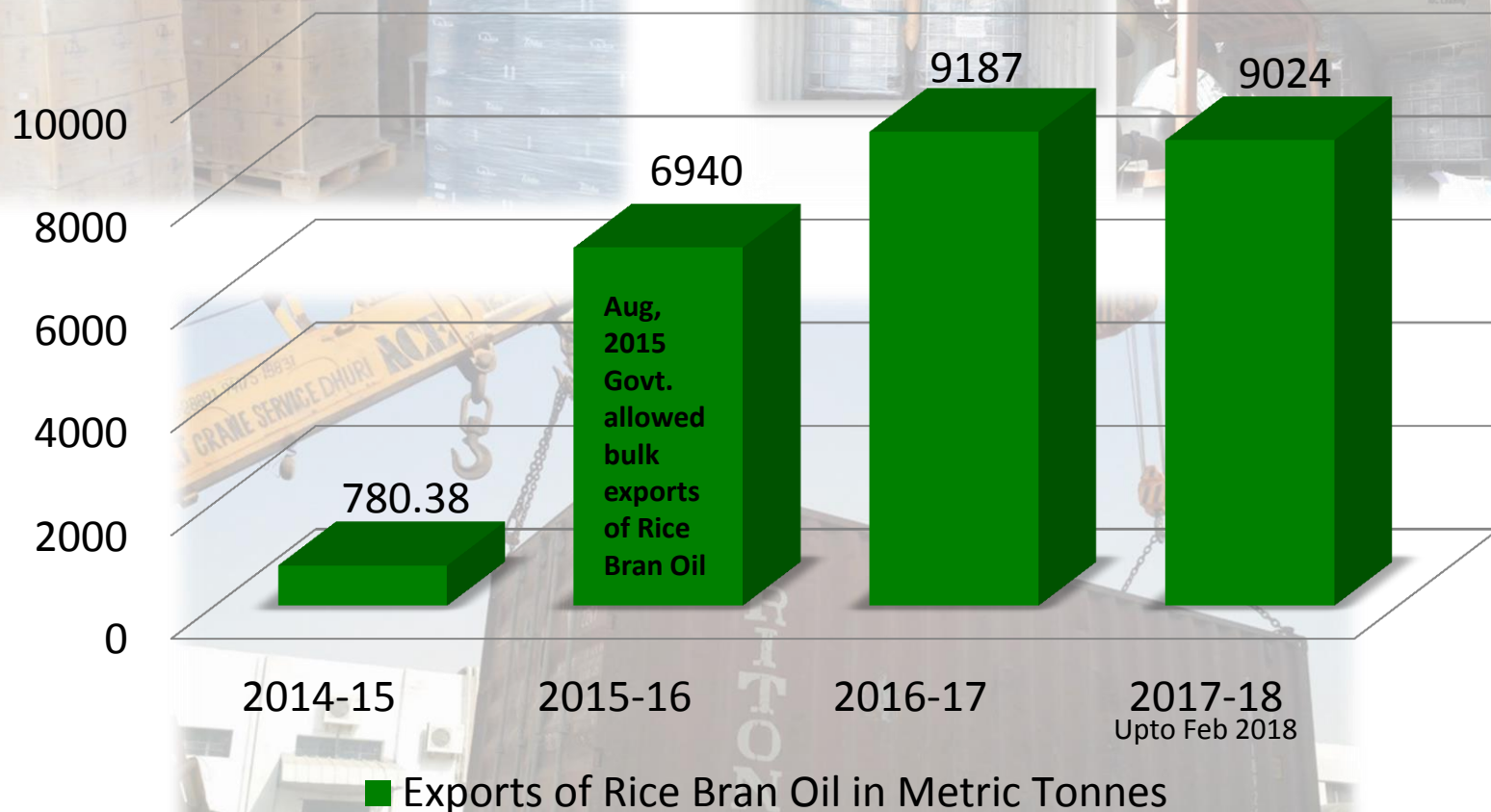
Export of Rice Bran oil in bulk has been exempted from the prohibition on export of edible oils Also, the quantity ceiling on export of organic edible oils has been removed.

**In August 2015,
Govt. of India
allowed
bulk export of rice
bran oil.**

**This has opened a
new avenue to tap
World Market by
India.**



Surge in exports of Rice Bran Oil after Govt. of India allowed bulk export of Rice Bran Oil.

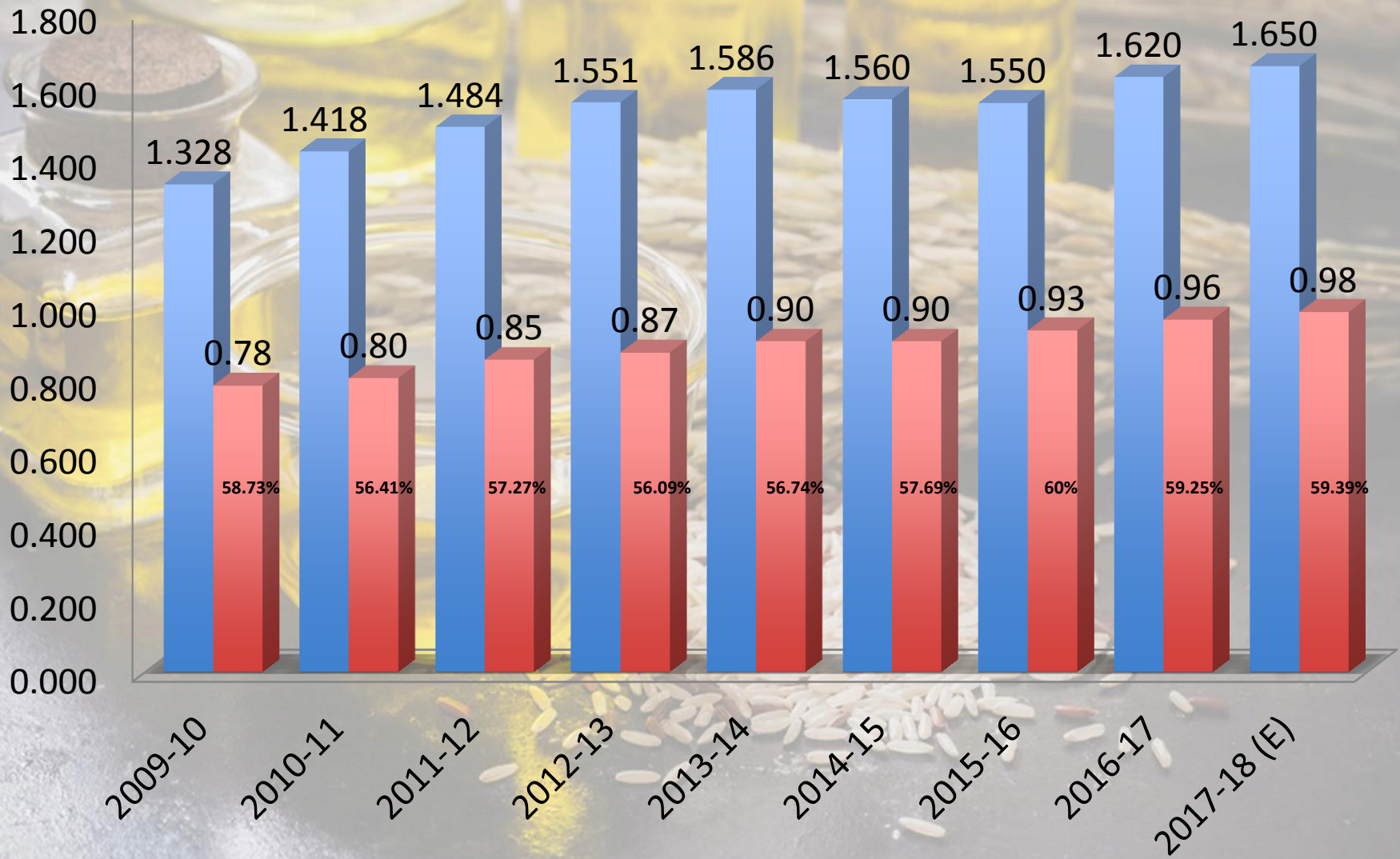




Globally India is now exporting to over 30 countries



Current Exploitation of Potential of Rice Bran Oil



■ Rice Bran Oil Potential in Million Tonne

■ Edible Rice Bran Oil Production in Million Tonne



Thank You

For your Kind Attention!