RICE BRAN OIL … GROWTH STORY

Presented at the OFI India 2017

19-20 May 2017

Bombay Convention & Exhibition Centre

Mumbai

- Biprabuddha Chatterjee

Head, R&D

Adani Wilmar limited

RICE BRAN OIL … GROWTH STORY

Edible Oil Scenario in India

India accounts for considerable share of global edible oils production and consumption, 4th largest in world:

- Vegetable Oil Sector Turnover Rs.125,000Cr
- Import & Export from Oilseed Sector Rs.65,000 Cr.
- In World's Oilseed Production 8.0 %
- In World's Oil meal Production 6.8 %
- In World's Oil meal Export 6.5 %
- In World's Production of Veg. Oils 5.2 %
- In World's Edible Oil Consumption 10.2 %

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Edible Oil Scenario in India

- Steadily increasing per capita consumption, 3-4%pa

  4 kg in the 1970s

  10.2 kg in the late 1990s

  ~13.5 - 14 kg at present

  ~2-Crore MT annually

- Imports rising from NIL in 1970's to ~65% currently
  - ~80-Lakh MT annual domestic production
  - ~1.2-Crore MT imported

    (13.6% of World's Vegetable Oil Import)

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Edible Oil Scenario in India

SLIPPERY GROUND

Edible oil demand/supply dynamics (in mn tonnes)

Particulars	2009-10	2010-11	2011-12	2012-13	2013-14*
Oilseed production	32.9	35.7	36.3	36.8	38
Oilseed crushed	25.1	29.1	28.9	29.2	29.4
Edible oil production	7.8	8.5	8.1	7.5	7.6
Imports	9.2	8.7	10.1	10.7	11.8
Total supplies	**17**	**17.2**	**18.2**	**18.1**	**19.4**
Import share (%)	**60.8**	**55.2**	**60.5**	**61.2**	**65.3**

* Estimates

Source : USDA and India Ratings

West Bengal has the highest area under rice cultivation, producing the maximum quantity of rice in India (14.5 MMT). Andhra Pradesh (AP) with production of 11

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Edible Oil Scenario in India

India: 2nd largest producer of rice in the world after China

~20% of the world's rice,

~90 MMTPA (~157 MMTPA of paddy)

Paddy occupies the 1st place among all crops in

area (~37%)

production (44%)

West Bengal: highest area, maximum production (14.5 MMT).

Andhra Pradesh (AP): 2nd highest (11.70 MMT)

Punjab: highest yield (3.86 MT/ha), 4th highest (10.19 MMT) despite much smaller area (2.64 MHa, 6.05%) under rice cultivation

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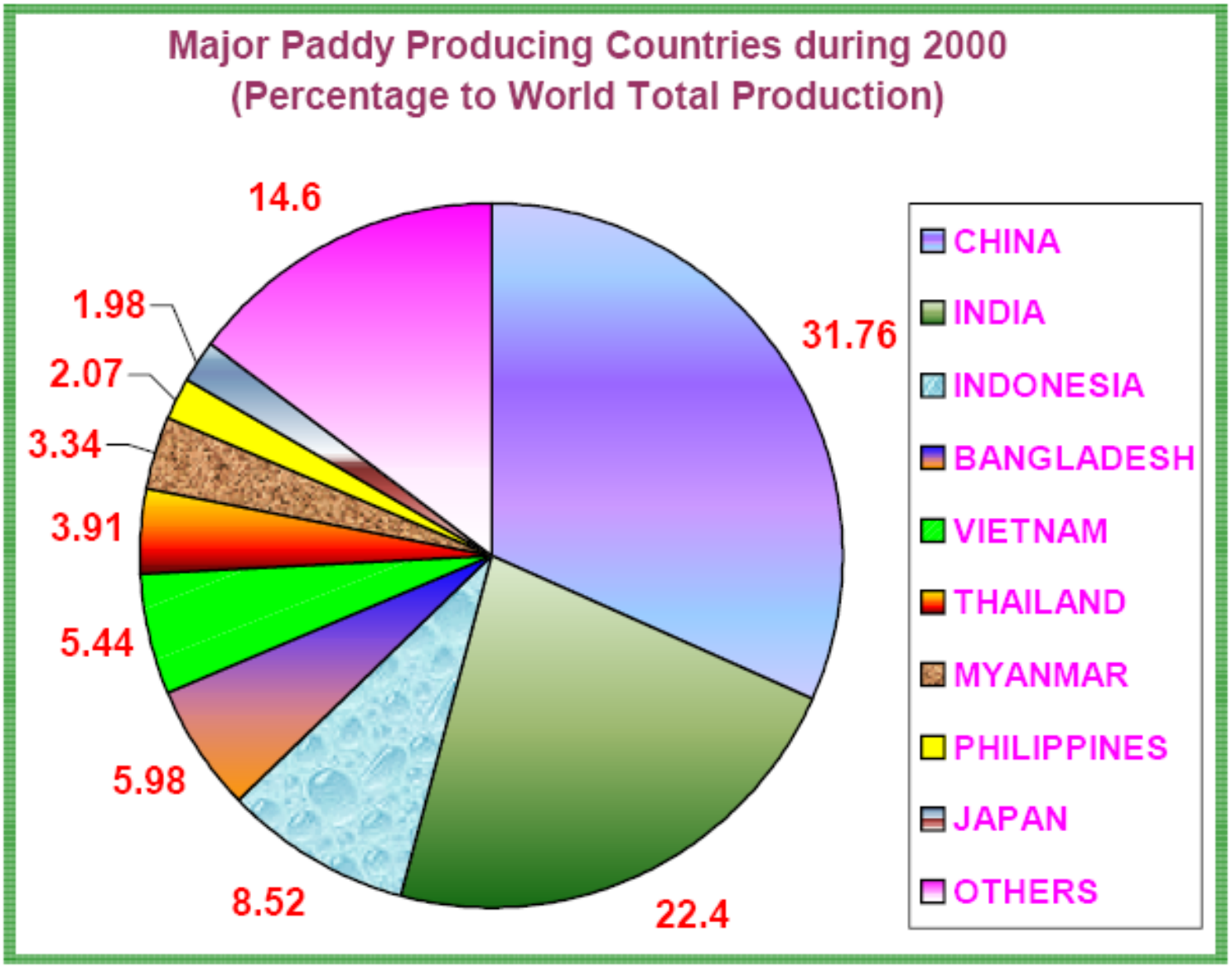
Edible Oil Scenario in India



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Edible Oil Scenario in India

Rice production in major Indian States (2005 – 2006)
(MHa = Million Hectares)
Note: States have been arranged in descending order of percentage share of production.

State	Area (MHa)	% of Total Area	Production (MMT)	% of Total Production	Cum. % of Total Prodn.	Yield (kg/Ha)
West Bengal	5.78	13.24	14.51	15.81	15.81	2509
Andhra Pradesh	3.98	9.12	11.70	12.75	28.55	2939
Uttar Pradesh	5.58	12.78	11.13	12.13	40.68	1996
Punjab	2.64	6.05	10.19	11.10	51.78	3858
Orissa	4.48	10.26	6.86	7.47	59.25	1531
Karnataka	1.49	3.41	5.74	6.25	65.51	3868
Tamil Nadu	2.05	4.70	5.22	5.69	71.20	2546
Chhattisgarh	3.75	8.59	5.01	5.46	76.65	1337
Assam	2.42	5.54	3.55	3.87	80.52	1468
Bihar	3.25	7.44	3.50	3.81	84.33	1075
Haryana	1.05	2.40	3.21	3.50	87.83	3051
Maharashtra	1.52	3.48	2.70	2.94	90.77	1779
Madhya Pradesh	1.66	3.80	1.66	1.81	92.58	999
Jharkhand	1.35	3.09	1.56	1.70	94.28	1150
Gujarat	0.67	1.53	1.30	1.42	95.70	1949
Kerala	0.28	0.64	0.63	0.69	96.38	2284
Others	1.71	3.92	3.32	3.62	100.00	N/A
All India	43.66	100.00	91.79	100.00		2102

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Rice Processing Scenario in India

Rice Bran: thin coating removed form brown rice in milling.

Rice Bran removed in milling is ~8.5% of the rice milled

Rice Bran is an important source of oil

Oil content varying between 12-20% depending upon

- ✓ quality of bran
- ✓ type of milling method used

Rice Bran Oil (RBO)potential in India is to tune of 1.32 MMTPA

Actual prodn. estimate is ~ 0.80MMT RBO (61% of potential) ~0.77MMT (96%) is edible, the rest is non edible grade

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Rice Bran Oil Scenario in India

- Calculation of Rice Bran Oil Potential in India:
- Present production of rice ~90 MMTPA.
- Potential availability for rice bran is 7.65 MMTPA
  @ 8.5% bran recovery potential in milling.
- The potential for rice bran oil is 1.26 MMTPA
  @ 16.5% oil recovery potential from bran.
- Actual production of Rice Bran Oil in India is 0.80 MMTPA
- Unexplored potential for Rice Bran Oil in India is 0.46 MMTPA

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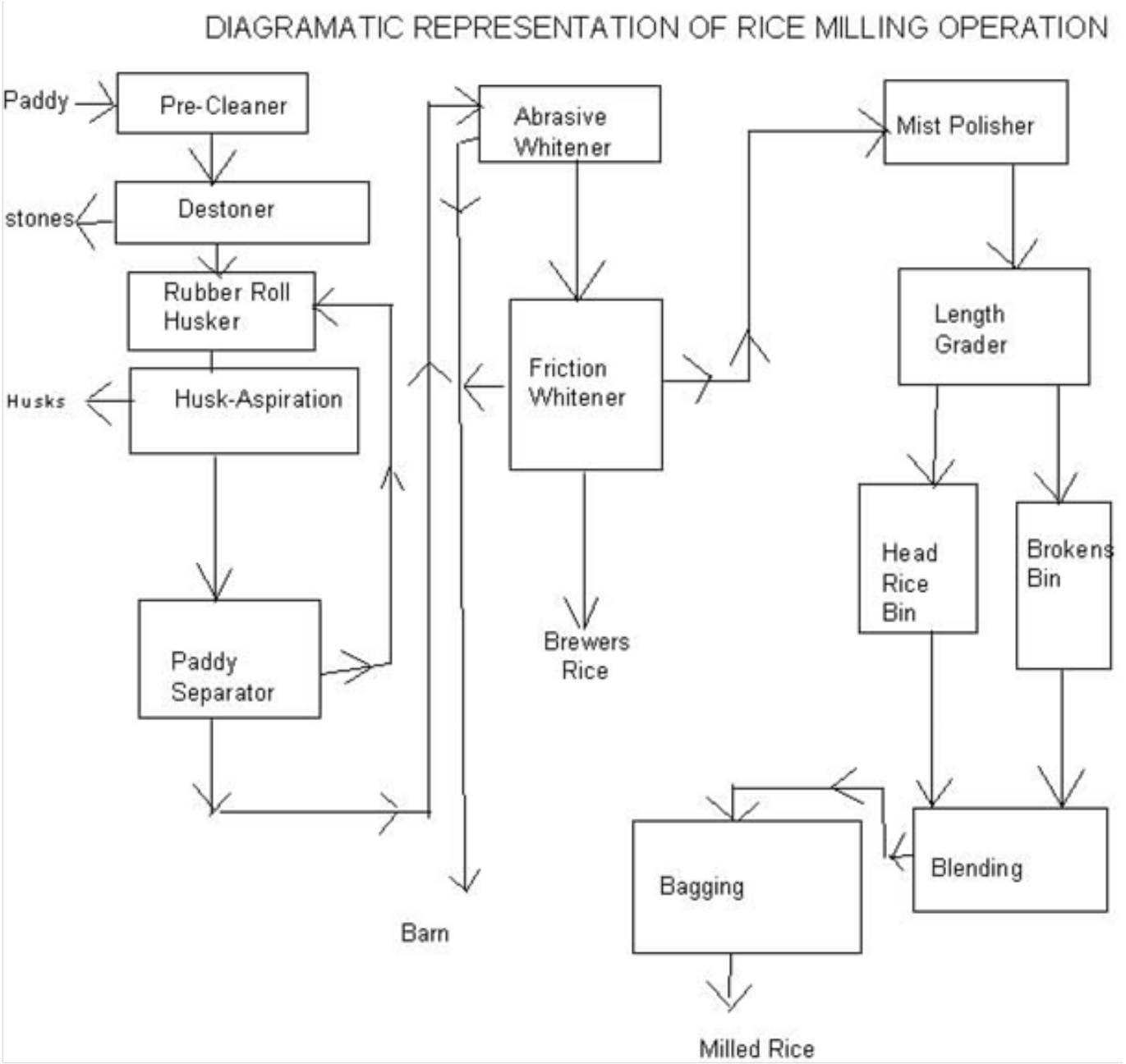

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Rice Bran Oil Scenario in India

- Majority (~75%) of RBO is used in mixing with other oils, mainly Groundnut Oil and Mustard oil
- Some quantity (~15%) is also used by the Vanaspati industry
- ~10% of the RBO (~0.077MMTPA) used as refined edible oil, alone or blended with other edible oils.
- Distributed over about 35 manufacturers across the country, the average consumer pack sales is about 4,500 MT pm, or less than 200 MT pm per manufacturer

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THE CHALLENGES TO RICE BRAN OIL IN INDIA

- Rapid deterioration of the oil in the bran due to a lipolytic enzyme which is activated during the polishing operation.

- The enzyme attacks the fat, splitting off free fatty acids so swiftly that 50% to 70% of the oil is affected in a matter of two to three days.

- The free fatty acids need to be removed during refining process, directly contributing to the processing losses and thus the overall cost of the refined oil.

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THE CHALLENGES TO RICE BRAN OIL IN INDIA

- The lipolytic enzyme is deactivated by wet-heat, like par-boiling of the paddy.
- ~60% of the paddy in India is par-boiled before milling, deactivating the lipolytic enzyme and retarding the formation of free fatty acids,
- Par-boiled rice bran also contains higher recoverable oil
- Due to the higher FFA content, RBO is almost exclusively physically refined to keep the processing losses low.

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THE CHALLENGES TO RICE BRAN OIL IN INDIA

Oil Content of Bran from Different Mills

Mill Type	Grade	Oil Content %
Huller	Raw	4 - 6
	Parboiled	4 – 6
Sheller	Raw	12 - 15
	Parboiled	15 – 20
Modern	Raw	12 - 15
	Parboiled	25 – 30

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THE CHALLENGES TO RICE BRAN OIL IN INDIA

Another challenge before popularization of RBO is its darker colour, specially the red hue.

Over years the Indian consumers have started believing that lower colour indicates a better quality of oil.

The higher colour and a slight haze of refined Rice Bran Oil is actually due to the highly nutritious unsaponifiable components that impart immense health benefits to Rice Bran Oil.

Technology has now been developed by IICT to reduce the colour and the haze of the refined Rice Bran Oil to a large extent.

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HEALTH BENEFITS OF RICE BRAN OIL

RBO has fatty acid composition closest to recommended by:

American Heart Association (AHA),

World Health Organization (WHO) and

Indian Council of Medical Research (ICMR)

RBO has unique ingredients:

Oryzanol,
Tocopherols & Tocotrienols (Vitamin-E)
Squalene

Phytosterols.

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HEALTH BENEFITS OF RICE BRAN OIL

Oil	Fatty Acids % Weight			Essential Fatty Acids	Antioxidants
	SFA	PUFA	MUFA	Omega-6/Omega-3	
Mustard /Rapeseed	6	27	67	2	Tocopherols
Sunflower	12	67	21	57	Tocopherols
Safflower	10	75	15	69	Tocopherols
Soyabeen	16	60	24	10	Tocopherols
Groundnut	20	30	50	32	Tocopherols
Rice Bran	18	37	45	15	Tocopherols Tocotrienols & Oryzanol
Recommended Ratios	33% or less	approx 33%	33% or more	Between 5 to10	As many as possible

West Bengal has the highest area under rice cultivation, producing the maximum quantity of rice in India (14.5 MMT). Andhra Pradesh (AP) with production of 11

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HEALTH BENEFITS OF RICE BRAN OIL

- Fatty Acids Composition of RBO closely matches the recommendations of AHA, WHO & ICMR, and is highly beneficial in lowering bad cholesterol (LDL) while improving HDL (good cholesterol): LDL ratio to reduce possibilities of atherosclerosis.
- Vitamin and natural nutrients that help lower cholesterol.
- Tocotrienol is a type of Vitamin E found the most in Rice Bran Oil. Tocotrienol helps to inhibit Cholesterol synthesis.
- Oryzanol is found only in Rice Bran Oil, not other vegetable oils. Oryzanol helps to lower cholesterol by reducing cholesterol absorption and liver cholesterol synthesis.

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HEALTH BENEFITS OF RICE BRAN OIL

- Phytosterol is found more in RBO than in other vegetable oils. RBO contains up to 18,000 ppm Phytosterols, which help reducing cholesterol absorption.
- Squalene of RBO is reported to be a quencher of singlet oxygen and a free radical scavenger and it has been shown to maintain the texture of skin. It is well known for its anti-wrinkle properties.
- RBO provides a rich source of overall nutrition & nutraceuticals and also has a very promising role to play in not only cardiac care but also diabetes (Annexure-10) and other ailments.

Thanks