Nutritional benefits and Nutritional claims of Rice bran oil

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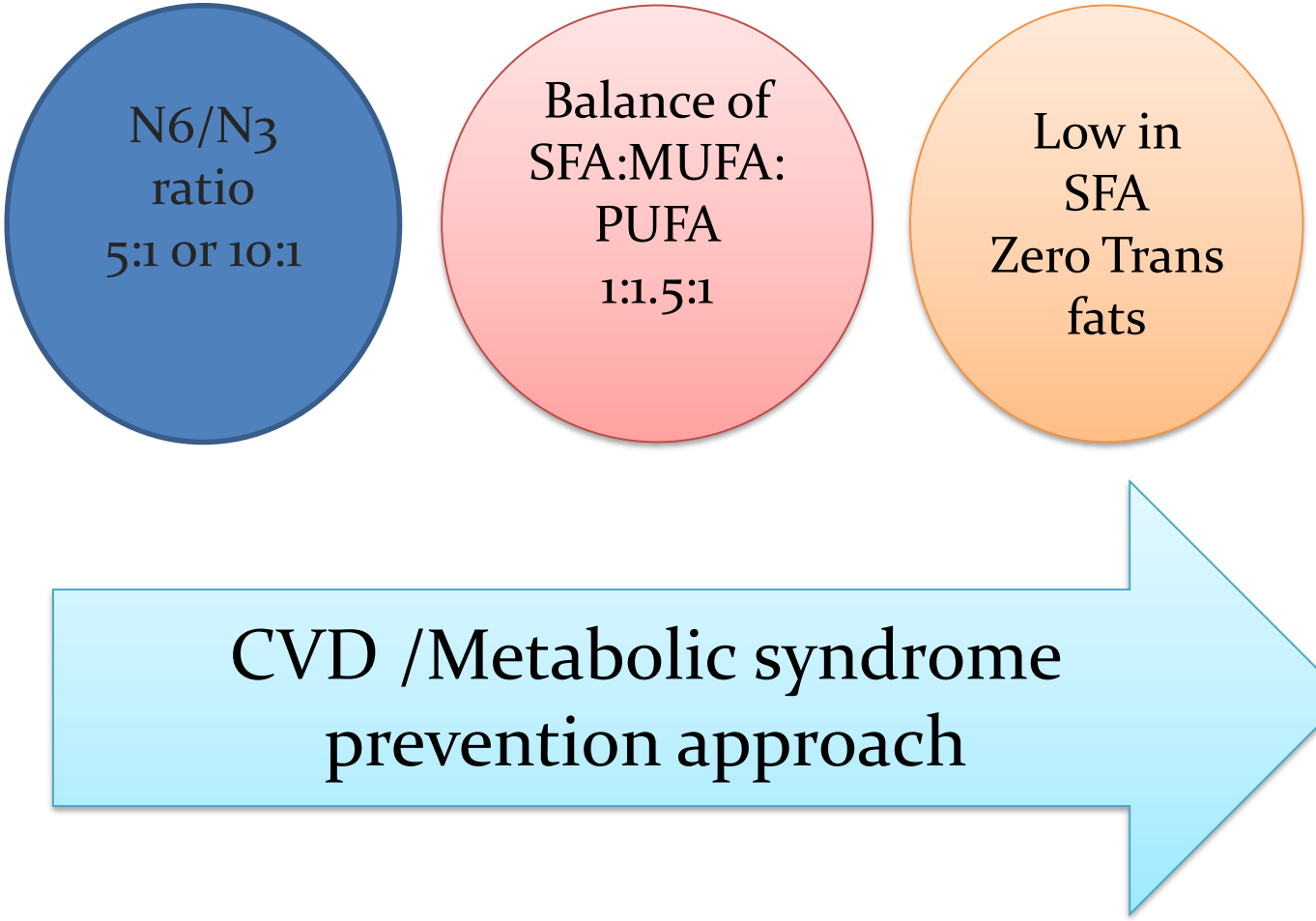
Guidelines-Mediterranean-style eating pattern rich in MUFA and PUFA , low in SFA



Nutrient requirement of Indian population 2020- NIN, ICMR
2021 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association.
RSSDI-ESI Clinical Practice Recommendations for the Management of Type 2 Diabetes Mellitus 2020
Standards of Medical Care in Diabetes - 2022
ICMR GUIDELINES FOR MANAGEMENT OF TYPE 2 DIABETES 2018

Role of SFA,MUFA & PUFA

	Diabetes			CVD	
	Insulin Resistance	Insulin Sensitivity	Triglycerides	LDL	HDL
SFA	↑	↓	↑	↑	↑
TRANS					↓
MUFA	↓	↑			↔
PUFA (n-6)		↓			↓
PUFA (n-3)	Inconclusive	Inconclusive	↓	↓	↔

Fatty acid composition of different oils

	Saturated	Monounsaturated	Linoleic	Alpha-linolenic	Predominant fatty acids
Coconut*	90	7	2	<0.5	Saturated
Palm kernel	82	15	2	<0.5	Saturated
Ghee[a,b]	65	32	2	<1.0	Saturated
Vanaspati[b]	24	19	3	<0.5	Saturated
Red palm oil (raw)	50	40	9	<0.5	Saturated + Monounsaturated
Palm oil	45	44	10	<0.5	Saturated + Monounsaturated
Olive	13	76	10	<0.5	Monounsaturated
Groundnut	24	50	25	<0.5	Monounsaturated
Rape/Mustard[c]	8	70	12	10	Monounsaturated
Sesame	15	42	42	1.0	Mono and polyunsaturated
Rice bran	22	41	35	1.5	Mono and polyunsaturated
Cotton seed	22	25	52	1.0	Polyunsaturated
Corn	12	32	55	1.0	Polyunsaturated
Sunflower	13	27	60	<0.5	Polyunsaturated
Safflower	13	17	70	<0.5	Polyunsaturated

[a]Mainly, short and medium chain fatty acids* (Coconut 77%, ghee 25%)
[b]Trans fatty acids (Ghee 2%, vanaspati 53%)
[c]Long chain MUFAs (50% eruric acid and 5% eicosenoic acid)
Source: Adapted from Diet and Heart Disease, National Institute of Nutrition.

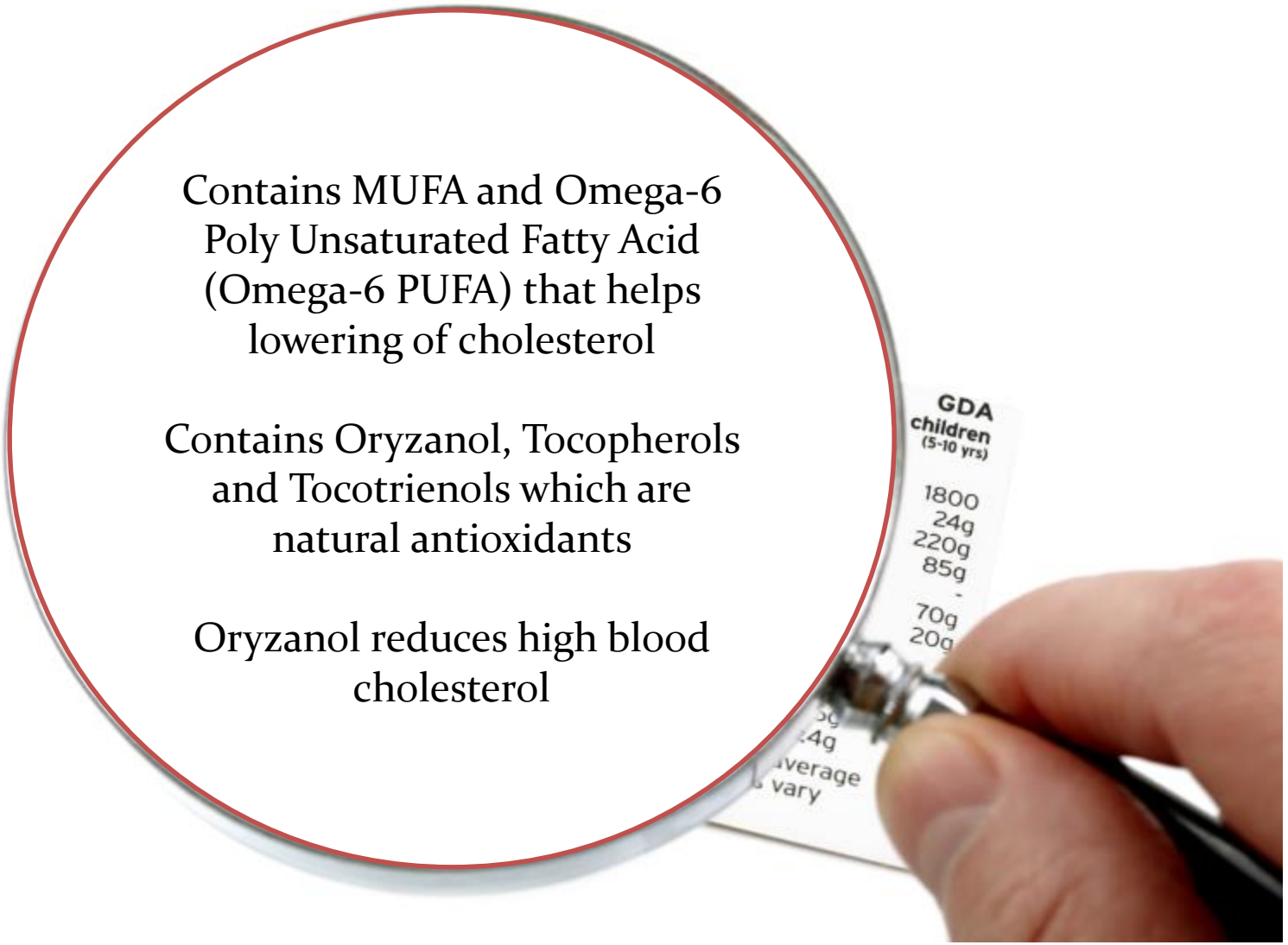
RBO-ideal balance of polyunsaturated fats (PUFA) and monounsaturated fats (MUFA), almost a 1:1 ratio- promotes heart health

Nutritional Claims for Rice Bran oil Approved by FSSAI

Contains MUFA and Omega-6 Poly Unsaturated Fatty Acid (Omega-6 PUFA) that helps lowering of cholesterol

Contains Oryzanol, Tocopherols and Tocotrienols which are natural antioxidants

Oryzanol reduces high blood cholesterol



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Health Benefits of Oryza Sativa-Rice Bran Oil

Unsaponiable fractions (triterpene alcohols, phytosterols, tocotrienols, γ- oryzanol (reduces the absorption of LDL and VLDL cholesterol) **anti-hyperlipidaemic and hypo-cholesterolaemic, anti- hypertensive , anti-hyperglycemic effects**

Low viscosity **less oil uptake during frying**

Mild flavor and neutral taste

Vitamin E (tocopherol and tocotrienol) **skin soft, supple, and wrinkle-free Boost immunity**

γ-oryzanol and vitamin E protect cells from **oxidative stress, anti-inflammatory**

γ- oryzanol helps manage hot flashes **Reduces Post-Menopausal Symptoms**

Punia S, Kumar M, Kumar A, Singh SP, Rice Bran Oil: Emerging Trends in Extraction, Health Benefit, and Its Industrial Application, Rice Science, Volume 28, Issue 3, 2021, Pages 217-232, ISSN 1672-6308,

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Smoke point of different oils

S.No	Name of oil sample	Peroxide value of fresh oil (meq/kg)	Smoke point (°c)
1	Ground nut oil	1.6	225
2	Sunflower oil	2.0	232
3	Coconut oil	1.2	205
4	Mustard oil	2.8	254
5	Rice bran oil	1.7	232
6	Castor oil	2.0	200
7	Olive oil	1.5	190
8	Vanaspati /hydrogenated vegetable oil	3.5	212
9	Buffalo ghee	0.5	198
10	Cow ghee	0.6	192

Cooking temperature

- Pan frying - 120 °C
- Deep frying - 160-200 °C
- Roasting/ Sautéing - 150 – 175 °C
- Oven cooking - 200 °C

- Rice bran oil has fairly good stability at frying temperature (180 ±2°C).
- Not much change in fatty acid composition but for about 9% loss in PUFA was observed.
- No *trans* fatty acid generated during the heating period in frying conditions
- Significant decrease was observed in tocopherol content but the oryzanol content changed only marginally

A Study on Smoke Point and Peroxide Values of different widely used Edible Oils Amina Sarwar , Shanthi Vunguturi , Aneesa Ferdose, International Journal of Engineering Technology Science and Research, ISSN 2394 – 3386 Volume 3, Issue 5 May 2016

Latha RB, Nasirullah DR. Physico-chemical changes in rice bran oil during heating at frying temperature. J Food Sci Technol. 2014 Feb;51(2):335-40. doi: 10.1007/s13197-011-0495-9. Epub 2011 Aug 20. PMID: 24493892; PMCID: PMC3907640.

Indian Council of Medical Research,
National Institute of Nutrition (India),
World Health Organisation,
American Heart Association,
the Chinese Cereals and Oils Association

have considered RBO as a 'healthy oil' due to its fatty acid profile and other constituents

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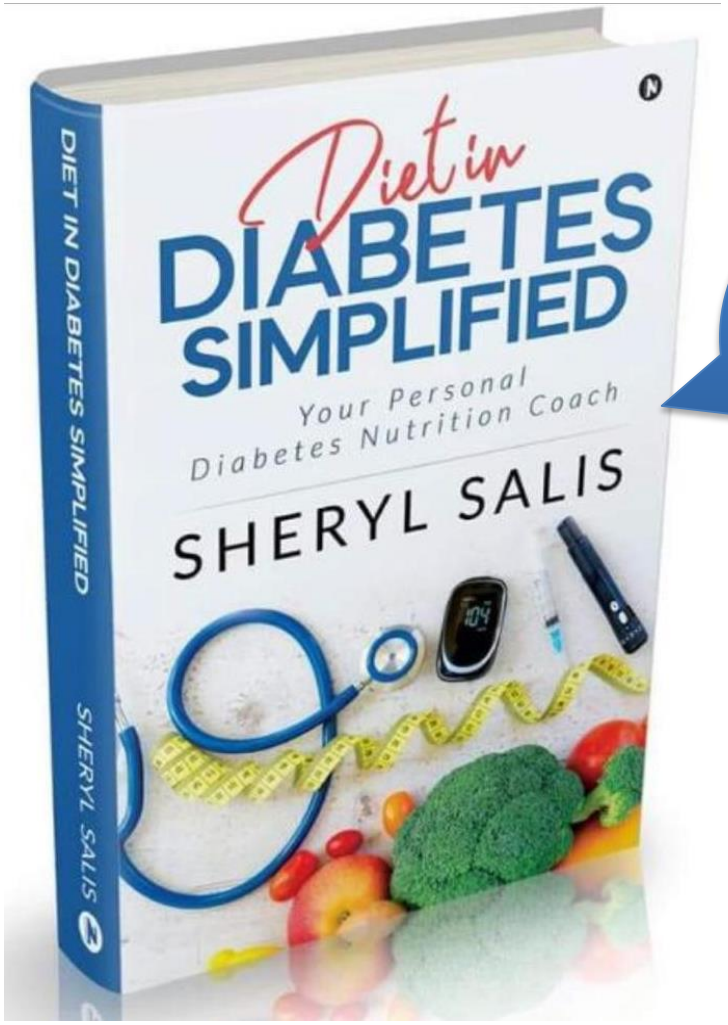

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