

COTTONSEED OIL CONCLAVE 2024

Hotel Courtyard by Marriott, Ahmedabad,
Gujarat,

Nutrition and Health benefits

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Head Regulatory Marico Ltd.

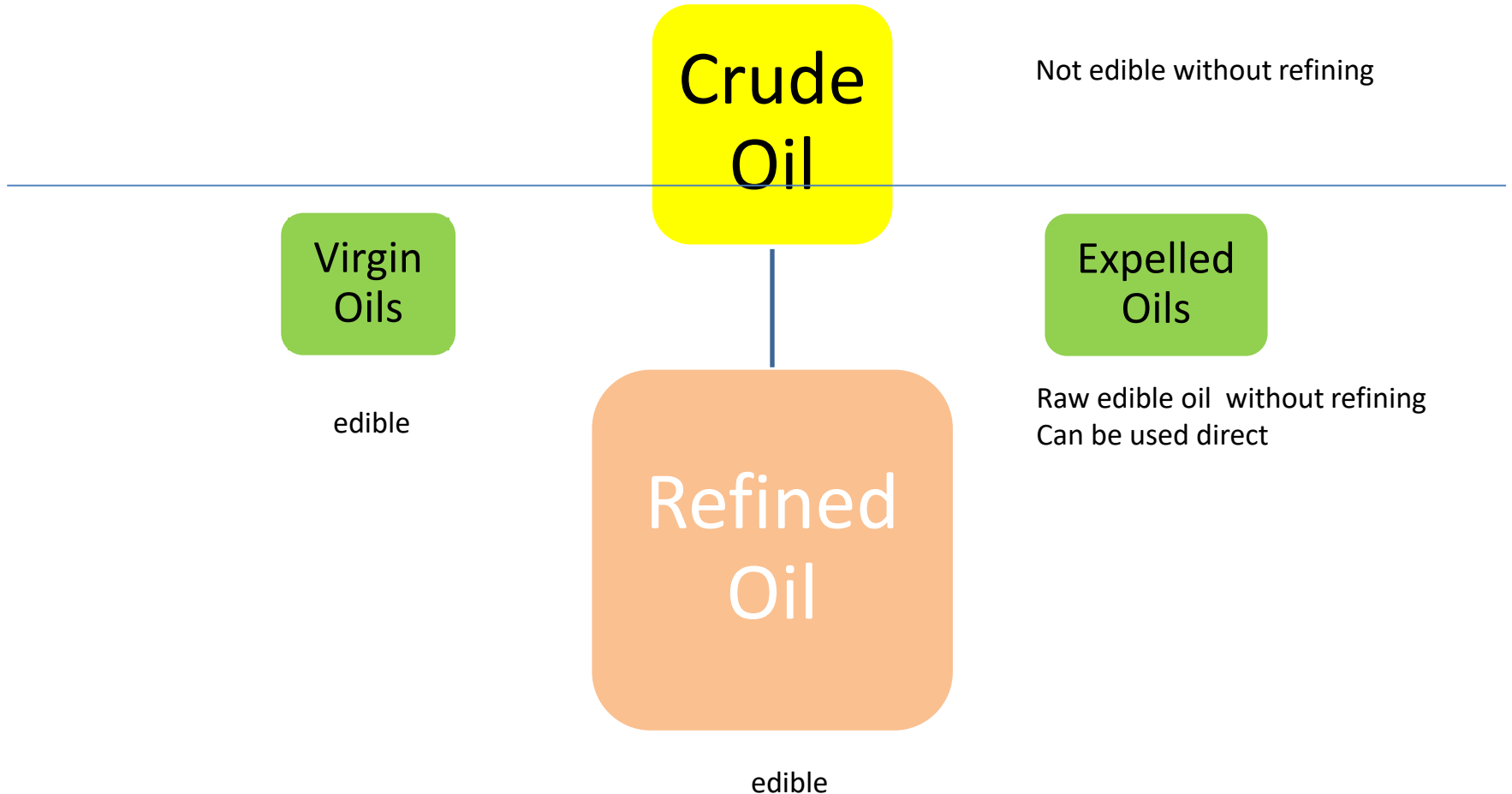
Reference of Cotton Seed Oil In History

कार्पासी तुण्डकेरी च समुद्रान्ता च कथ्यते ।
कार्पासकी लघुः कोष्णा मधुरा वातनाशिनी ।
तत्पलाशं समीरघ्नं रक्तकृन्मूत्रवर्धनम् ॥१३०॥
तत्कर्णपीडकानाद पूयास्राव विनाशनम् ।
तद्वीजं स्तन्यदं वृष्यं स्निग्धं कफकरं गुरु ॥१३१॥
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कार्पासी मधुरा शीता स्तन्या पित्तकफापहा ।
तृष्णादाहश्रमभ्रान्ति मूर्छाहृद्वलकारिणी ॥१८९॥
रा.नि.

- Cotton has been cultivated in India from 5000 yr
- Ayurveda has given lots of benefits of Cotton seed & its oil
 - **Cotton seed:**
Quality- Snigdha – Oily, unctuous
Vipaka – Madhura – Undergoes sweet taste conversion after digestion
Veerya – Sheeta – coolant
Kaphakara – increases Kapha Dosha.
Prabhava – Seed – Vrushya – aphrodisiac,
 - improves vigor

Seed is Vatanashini – useful in treating disorders of Vata Dosha imbalance such as neuralgia, paralysis, constipation, bloating, etc
Seeds promote lactation

Types of Edible Oil



Every oil has its own Nutrition and Quality and requirement

COMPONENTS OF FOOD

Healthy diets are balanced in the context of

Macro Nutrients:

- Proteins – build muscle and cells (4 K cal/g)
- Carbohydrates- starch and sugars – energy (4 K cal/g)
- Fats and oils – cell membranes and energy (9 K cal/g)

Micro Nutrients:

- Minerals and vitamins - health
- Fibre – helps food move through the intestine
- Water – hydration of the body

How much Fat to Consume?

- ❖ 25 to 30% of total Calories must come from Oils/fats (from all the Sources of Food) – WHO & ICMR Guidelines
- ❖ From 2000 K Calorie Diet: ~65 grams of Oil/Fat
- ❖ From 1500 K Calorie Diet: ~50 grams of fat
- ❖ But One Must Consider Consumption of Invisible Oils & Fats (about 15 g in rural population and 30 g among urban middle-income and high-income groups) also in addition to the Oil We Purchase and Consume in our Kitchen...

Why We Consume Oils?

1. Carry, Enhance and Release the Flavours of Other Food Components - Increase Palatability of Food
2. Energy Storage, Provides Energy and Nutritional Value
3. Physical & Thermal Insulator - Acts like a “cushion” and heat regulator to protect heart, liver and other vital organs
4. Carrier of Fat Soluble Vitamins (A,D,E & K) - Require fat for the stomach to allow them to be carried into the blood stream (absorption) - Can be stored in the body for later use
5. Promotes healthy skin - Provide shape and contour to the body
6. Lipoproteins are important cellular constituents - Act as Metabolic Regulator; Serve as the means of transporting lipids in the blood
7. Clinical significance of lipids: Obesity, Atherosclerosis, Diabetes Mellitus, Fatty liver, Lipid storage diseases, Cardiovascular Related Problems

IMPORTANT PROPERTIES OF OILS & FATS

❖ FUNCTIONAL PROPERTIES

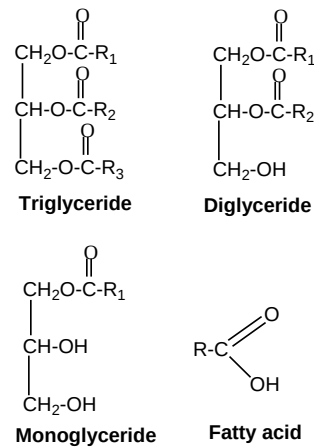
- ✓ **Good Melting profile**
- ✓ **Desired Plasticity**
- ✓ **Crystallization**

❖ NUTRITIONAL QUALITY

- ✓ **Balanced Fatty acid composition**
- ✓ **No trans fatty acid**
- ✓ **High antioxidant content**
- ✓ **More Oxidation stability**
- ✓ **Presence of Nutraceuticals**
- ✓ **No contaminants**

COMPOSITION OF VEGETABLE OILS

Structures of MG, DG. TG and FFA



$\text{R}_1, \text{R}_2, \text{R}_3$ = Saturated or Monounsaturated or Polyunsaturated alkyl chain ($\text{C}_6 - \text{C}_{24}$)

- Major Component of Oil is Triacyl glycerol
- Minor Components: Free Fatty Acid, MG, DG, FFA, Phospholipids, Glycolipids, Sterols, Tocopherols, Wax, Steryl Esters etc.

IMPORTANT CHEMICAL CONSTITUTENTS OF UNSAPONIFIABLE MATTER

Oil	Unsaponifiabiles (%)	Unsaponifiable constituents
Rapeseed / canola	2.0	Sterols, tocopherols
Soybean	1.5	Tocopherols, sterols, triterpene alcohols, squalene
Palm	1.2	Tocotrienols, tocopherol, carotenoids, sterols, ubiquinones
Sesame	2.0	Tocopherols, sesamolin, sesamin, sesamol, Sterols
Rice bran	3.5	Waxes, tocopherols, tocotrienols, oryzanol, phytic acid, sterols, steryl esters, squalene
Olive	1.0	Hydroxytyrosol, elauopein, phenolic acids, tocopherols
Oat	6.0	Tocopherols, sterols, sterol esters, polar lipids, ferulates, caffeates
Avocado		Tocopherols, sterols, triterpene alcohols
Shea butter / olein	6.0 / 12.0	cinnamic acid esters, sterols and triterpene alcohols
Wheat germ oil	3.0	Tocopherols, ferulic acid esters with triterpenic alcohols, polar lipids
Sunflower	1.0	Waxes, tocopherol, sterols, squalene, chlorogenic acid

PROCESSING OF VEGETABLE OILS

- Unit operations of processing
 - Seed preparation
 - Extraction of the oil
 - Filtration
 - Degumming
 - Chemical (Neutralization) or Physical (Deacidification) refining
 - Bleaching
 - Dewaxing
 - Deodorization / Deacidification
 - Winterization
- Refining to remove the impurities, which adversely affect safety, flavor, odor and appearance of the oil

IS REFINING MUST FOR OILS?

NO...

- **Groundnut oil**
- **Sesame oil**
- **Coconut oil/Virgin Coconut Oil**
- **Mustard oil**
- **Safflower oil**
- **Linseed oil**

In some cases, these seeds are also affected by poisonous substances like aflatoxin during harvesting, and in such instances, it is advisable to refine these oils also before consumption.

YES...

- **Sunflower oil**
- **Soybean oil**
- **Cottonseed oil**
- **Palm oil**
- **Rice bran oil**
- **Corn oil**

REQUIREMENT OF OILS & FATS

- ❖ ~30% of total Calories must come from Oil/fat (from all the Sources of Food)
- ❖ From 2000-Calorie Diet: ~66 grams of Oil/Fat
- ❖ From 1500-Calorie Diet: ~50 grams of fat
- ❖ But One Must Consider Consumption of Invisible Fat also in addition to the Oil We Purchase...

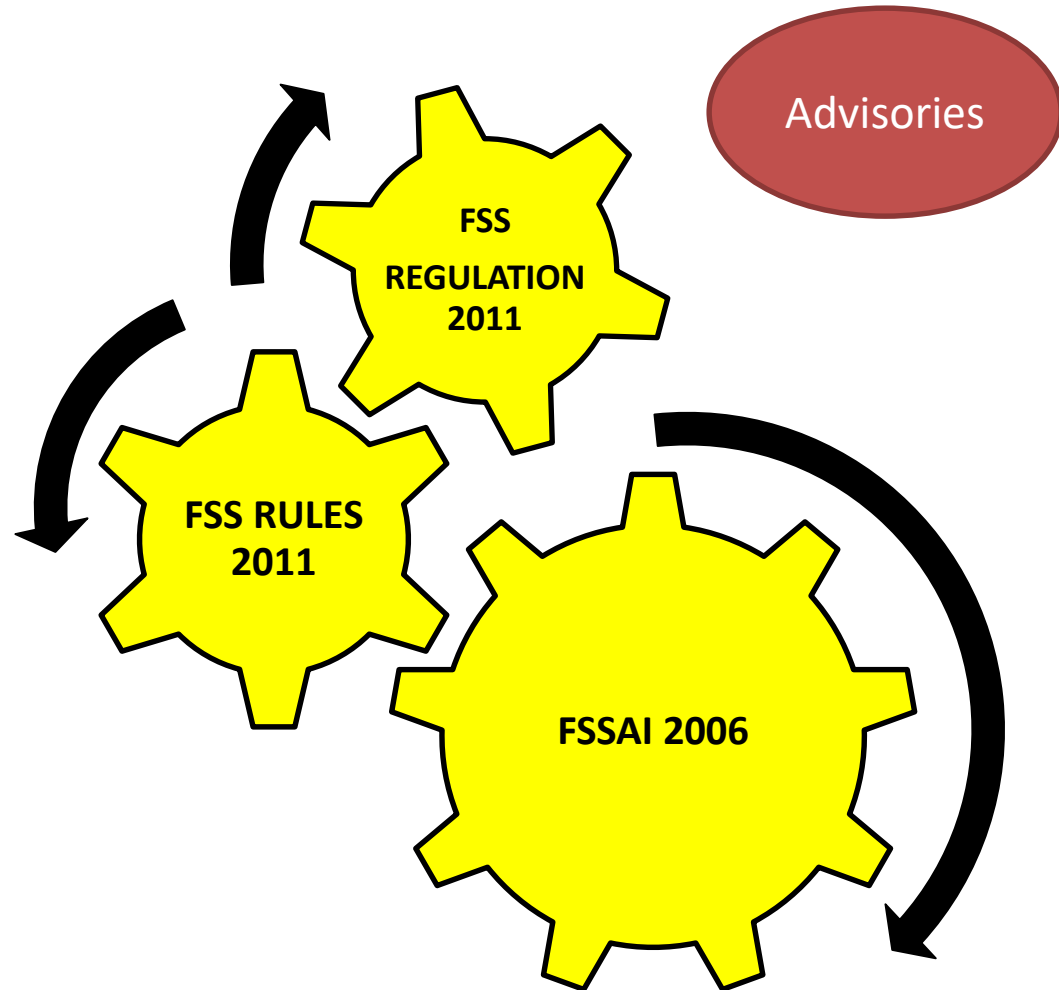
Oil Benefits

Cooking Oil	Fatty Acids/Nutritional Components
Coconut Oil Palm Kernel Oil	Contains medium chain fatty acids that are easily metabolized; lacks Mono and Poly unsaturated fatty acids (PUFA)
Palmolein Oil	- Rich in Saturated and Monounsaturated fatty acids with low quantities of PUFA - Contains Tocopherols and Tocotrienols which are natural antioxidants
Olive Oil	- Rich in Mono unsaturated fatty acids (MUFA) that helps Lowering LDL Cholesterol; smaller amounts of SFA and PUFA - Contains polyphenols which are natural antioxidant.
Groundnut Oil, Rice Bran Oil	- Contains MUFA and Omega-6 PUFA that helps lowering of plasma cholesterol; contains medium content of SFA, but lacks in Omega-3 - Groundnut oil and RBO Contains Tocopherols which are natural antioxidants. - RBO Contains Oryzanol which has antioxidant and hypocholesterolemic activity
Safflower Oil, Cottonseed Oil, Sunflower oil, Corn Oil,	- Rich in Omega-6 Fatty (linoleic acid) which is an essential fatty acid that helps lowering of plasma cholesterol; Contains low amounts of SFA, MUFA - Cottonseed and sunflower oils Contain higher content of Tocopherols which are natural antioxidant

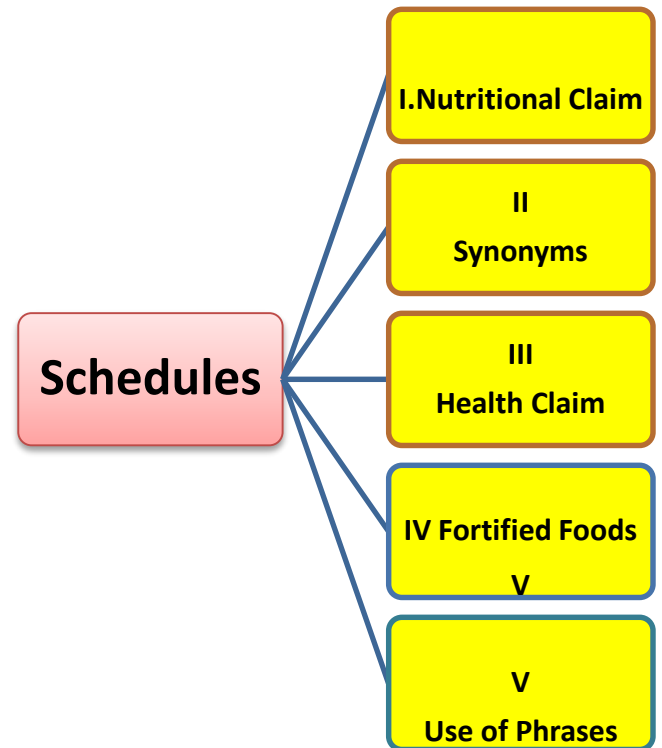
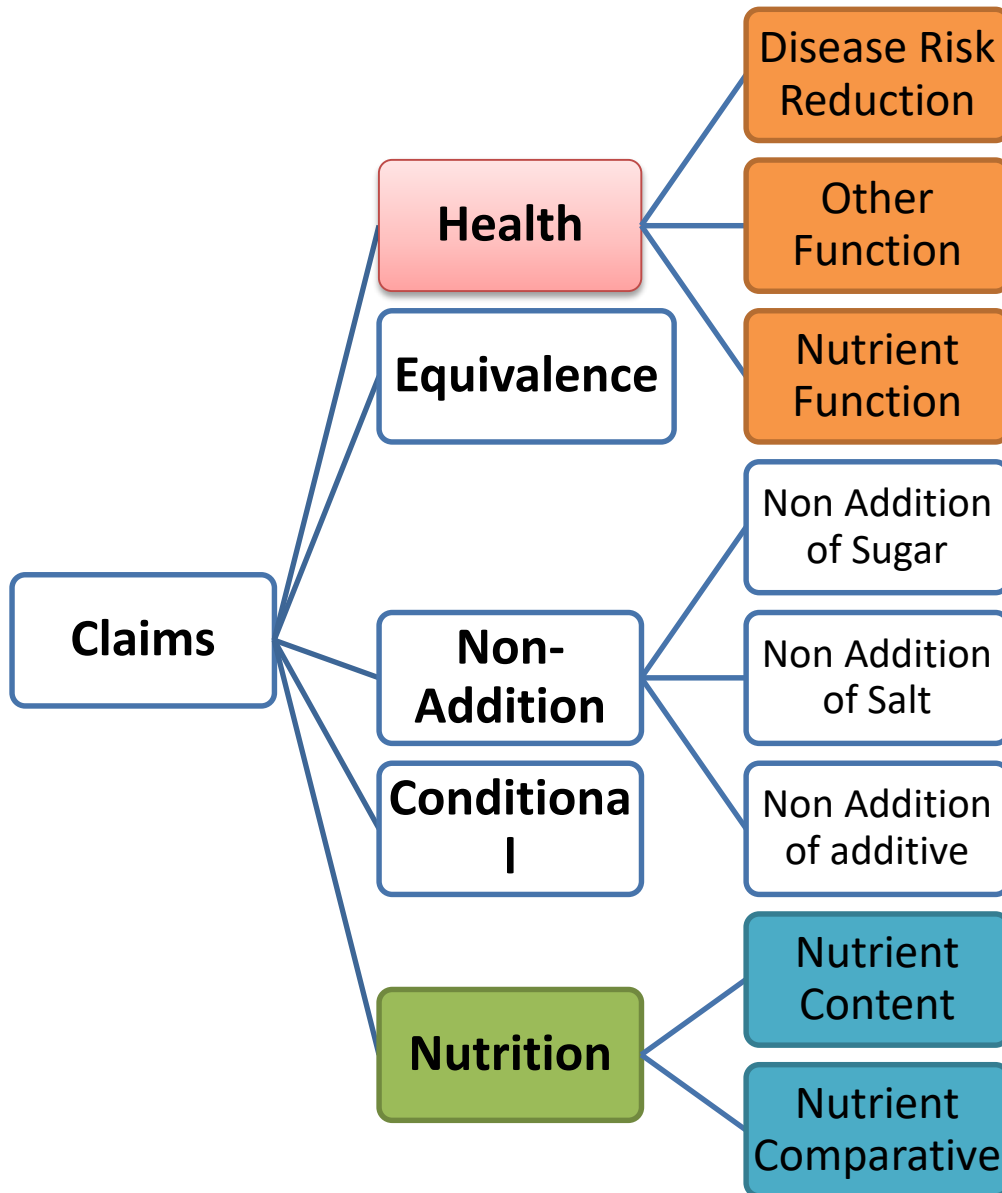
Oil Benefits

Cooking Oil	Importance
Sesame Oil	• Contains equal proportions of MUFA (oleic acid) and Omega - 6 PUFA (Linoleic acid) that helps lowering of plasma cholesterol; Contains low quantities of SFA • Contains lignans which are antioxidants and possess hypocholesterolemic and Anti-inflammatory activities • Contains Tocopherols which are natural antioxidant
Mustard Oil	• Contains Erucic acid (long chain fatty acid, MUFA) • Contains Omega-3 fatty acid, Alpha linolenic acid is an essential fatty acid that contributes to the maintenance of normal blood cholesterol • Contains Tocopherols which are natural antioxidant.
Soybean Oil	• Contains Omega-6 Fatty acid (linoleic acid) and Omega-3 fatty acid (alpha linolenic acid); contains smaller amounts of SFA and MUFA • Contains Tocopherols which are natural antioxidant
Linseed/ Flax Seed Oil	• Rich in Omega-3 Fatty Acid (Alpha linolenic acid)

FSSA Legislative Frame

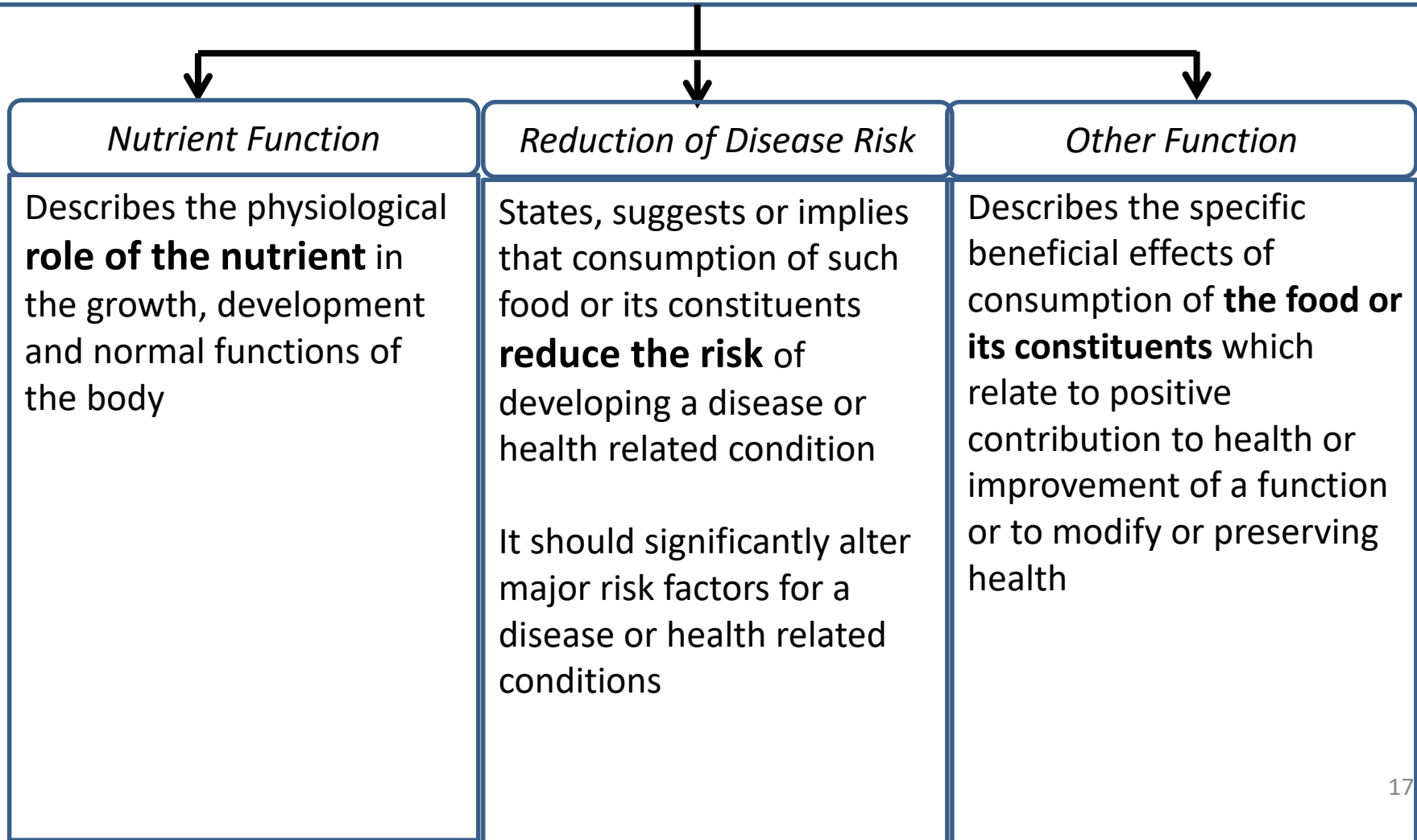


CLAIM CATEGORIZATION



HEALTH CLAIM

Any representation which states, suggests or implies that a relationship exists between a food or a constituent of that food and health



Approved Nutritional claim by FSSAI on Cotton Seed oil

Cottonseed Oil

☐ Rich in Omega-6 Poly Unsaturated Fatty Acid (Omega-6 PUFA, linoleic acid); ☐

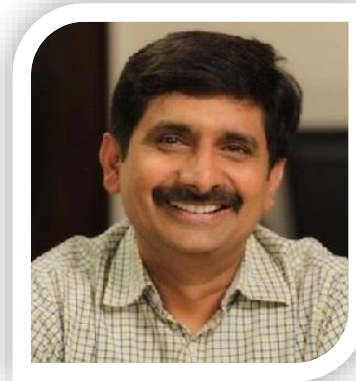
Linoleic acid is an essential fatty acid that helps to maintain normal blood cholesterol levels;

☐ Contains Tocopherols which are natural antioxidant.

PROHIBITED CLAIMS



- No claims shall be made around **prevention, alleviation, treatment or cure** of a disease, disorder or particular physiological conditions
- No label should contain '**recommended by medical or nutrition or health professionals**' or any words which imply or suggest that the food is recommended, prescribed or approved by medical practitioners or approved for medical purpose
- Don't claim '**added nutrients**' if nutrients are merely added as compensation
- FSDU and FSMP to carry a claim only if specifically permitted
- **Do not undermine the products** of any other manufacturer
- Foods Shall not be described as "**healthy**" or present in a manner that implies the food will impart health



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