

A Review on Various Edible Oils

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ABSTRACT

Oils of plant origin have been predominantly used for food-based applications. Plant oils not only represent a non-polluting renewable resources but also provide a wide diversity in fatty acids composition with diverse applications. Different types of edible oils are Olive oil, Safflower oil, Sunflower oil, Rice bran oil, Groundnut oil, Coconut oil, Sesame oil. These oils consist of fatty acids like saturated fats, monosaturated fats, polyunsaturated fats, triglycerides, Cholesterol. Dietary fats are closely related to Coronary Artery Diseases(CAD), cholesterol, saturated fats and trans fats are harmful whereas MUFA, PUFA(Omega-3 PUFA) are beneficial to heart, inflammation, etc. This article reviews the benefits/harms of common edible oils on different diseases.

I. INTRODUCTION:

Edible oils are a dietary source of lipids that are crucial for balanced diet. Oils are essential for health, which are extracted from plants and animals. Edible oils are also called as cooking oils. A dietary ingredient that should not come from any dairy product and is entirely manufactured for human consumption or partially made from a fat or oil other than milk, regardless of its contents, source, or origin are known as edible oils. WHO emphasizing dietary guidelines to reduce the utilization of saturated and trans-fats. These fats have negative impact on cardiovascular health, which is associated with the level of low density

lipoprotein (LDL), also known as “Bad Cholesterol”.

DIFFERENT TYPES OF EDILE OILS

- 1.Olive oil,
 - 2.Safflower oil,
 - 3.Sunflower oil,
 - 4.Rice bran oil,
 - 5.Ground nut oil,
 - 6.Coconut oil,
 - 7.Sesame oil,
 - 8.Palm oil.
1. Olive oil : olive oil is extracted from the fruit of Olea europaea and its PH below 3.3. It consist of Anti- oxidants (hydroxytyrol).
2. Safflower oil: safflower oil is extracted from the seeds of safflower plant. It is rich in essential fatty acids, linoleic acid.
3. Sunflower oil: It is obtained from the seeds of helianthus annuus. It consist of lecithin, tocopherols, carotenoids, and waxes.
- 4.Rice bran oil: Rice bran oil is collected from the germ and inner husk of oil. It is very smoky at 254 c and its having mild flavor.
5. Groundnut oil: It is a vegetable derived oil obtained from the edible seeds of peanut plant. It is also known as arachis oil.
6. Coconut oil: Coconut oil is made from cocos nucifera. It contains vit E, K, and minerals.
7. Sesame oil: Sesame oil is extracted from the seeds of the sesame plant. It consist of vit E.
8. Palm oil : Palm oil is obtained from the pulp of the fruit of the olive palm. It is cheaper and having maximum smoke point for frying .

MAJOR CONSTITUENTS OF EDIBLE OILS

OILS	MUFA %	PUFA %	SFA %	O6FA %	CHO %
Olive oil	71	9	32	8	0
Safflower	14	76	10	76	0
Sunflower	19	64	10	64	0.56
Rice bran	38	34	25	32	0
Sesame	39	40	14	40	0
Coconut	6	1	84	1	0.15

Groundnut	44	31	16	31	0,71
Palm oil	36	9	48	9	2

Edible oils are the complex mixtures containing a variety of different compounds. Saturated fatty acids, monounsaturated fatty acids and polyunsaturated fatty acids, omega 6 fattyacids are in different concentrations including triacylglycerols (TAGs)which are also called as triglycerides(TGs) and a lesser amount of diacylglycerols, free fatty acids(FAs), phospholipids, and other substances.

Saturated fatty acids (SFAs) are bad cholesterol and unhealthy for health. It is a type of fat which make blood thicker and leads to the heart diseases.

Eg: coconut oil

Polyunsaturated fat (PUFA) are another type of fat that are consumed in low levels of LDL cholesterol along with HDL cholesterol.

Eg: Safflower oil, Sunflower oil.

Monounsaturated fat (MUFA) are the best fats and are good for health because they are consumed in lower LDL cholesterol and elevates the HDL cholesterol levels.

Eg: Groundnut oil, Olive oil.

Triacylglycerols (TAGs) are the main components of oils nearly 95-98% of whole oils. They contain glycerol molecules linked to three medium of long chain fatty acid residues.

Eg: Olive oil, Groundnut oil.

Diacylglycerols are made up of a glycerol backbone esterified with 2 fatty acids, It has several health benefits that suppress body fat accumulation.

Eg: Olive oil.

Free fatty acids (FFAs) are the hydrolysis product of triglycerides in edible oils. They mostly arise in edible oils throughout the process of making and storing the oil as well as while handling the raw materials.

Phospholipids are a group of polar lipid which are made up of 2 fatty acids, a glycerol, and a phosphate that is esterified to an organic molecule.

Eg: Groundnut oil.

MINOR CONSTITUENTS IN EDILE OILS

OILS	Palmitic acid	Stearic acid	Oleic acid	Linoleic acid	Arachidic Acid	Behenic acid	Linolenic acid
Rice bran	15	1.9	42.5	39.1	0.5	0.2	1.1
Safflower	5.28	1.79	14.17	21.04	0.372	0.05	0,08
Sunflower	6.99	4.16	34.51	55.03	0.33	0.96	52.38
Olive	12.2	2.44	73.62	9.42	0.36	0.61	0.40
Palm	44	4.5	39.2	10.1	0.1	1.1	0.4
Coconut	6.68	0.011	1.481	0.231	0.013	15.803	1.168
Groundnut	8.22	2.45	58.68	21.76	1.83	3.88	0.34
Sesame	9.31	5.48	42.91	41.28	0.66	0.40	0.44

OLIVE OIL: It consist of monounsaturated fatty acids, which constitute high amounts of oleic acid.

Advantages: Decreases the incidence of degenerative diseases such as congestive heart disease and cancer. Anti-inflammatory disease, skin diseases and hair. Traditionally used to treat colic, alopecia, paralysis, rheumatic pain and hypertension.

Dis-advantages: It is high calorie-dense, around 120calories per tablespoon. Overconsumption can lead to weight gain. Not suitable for high temperature cooking, possible allergic reactions. Impact on HDL cholesterol.

SAFFLOWER OIL: It is rich in fatty acids like linoleic acid and oleic acid.

Advantages- It maintains heart health, weight management. Anti-inflammatory properties, skin health and cooking versatility.

Dis-advantages: Over intake of omega 3 fattyacids leads to inflammation. Increases the calorie density and effect the cholesterol levels.

GROUNDNUT OIL: It consists of oleic acid. Linoleic acid and palmitic acid mostly.

Advantages- It promotes cardiovascular activity, protect cell from oxidative damage caused by free radicals as it is rich in anti-oxidants, skin benefits, high quality of protein.

Dis-advantages: Peanut proteins triggers allergic reactions in sensitive individuals, overconsumption leads to weight gain, it varies cholesterol levels.

COCONUT OIL:

Coconut oil is 84% saturated fat and therefore raises cholesterol levels to animal fat (butter, fat). However, it contains a unique type of medium chain saturated fat called as lauric acid that shows raises HDL or “good” cholesterol levels which may lower overall heart diseases.

Coconut oil primarily consists of saturated fats, specifically medium chain fatty acids. The major components are lauric acid, caprylic acid, and capric acid, which make up a significant portion of its composition. It may also contain trace amounts of vitamins and antioxidants.

Advantages:- It contains a high proportion of medium-chain fatty acids (MCFAs), which are believed to be more easily digestible and may provide a quick source of energy. It is often used in skin care and hair products. It has a high smoke point, making it suitable for cooking at higher temperatures. It aids in weight management by increasing feelings of fullness and boosting calorie expenditure. It contains antioxidants that could potentially help combat oxidative stress and inflammation.

Disadvantages:- It consists of saturated fats, excessive consumption may lead to increasing heart diseases and high cholesterol levels. Over consumption leads to weight gain if not taken a balanced with calorie intake. It does not provide essential nutrients like vitamins and minerals. People with nut allergies should be cautious while taking this oil.

PALM OIL: It consists of triglycerides, which are a type of fat. It contains a balanced mixture of saturated and unsaturated fats. Specifically, palm oil is composed of approximately palmitic acid, oleic acid, linoleic acid. Additionally, palm oil may contain small amounts of vitamins and antioxidants.

Advantages:- It is highly productive, it is used in food products to skin care products. It has extended shelf life and texture. It consists of Vitamin E and K which provide a balanced diet. It has high smoke point which is suitable for cooking.

Disadvantages :- Deforestation palm oil plantations contributors to carbon emission and mangrove drive of climate change. Process of palm oil leads to water pollution. Excess intake of oil leads to health issues like elevated heart rate due to increasing cholesterol levels in the body.

RICE BRAN OIL: It consists of unsaturated fatty acids like mono unsaturated fatty acids (Oleic

Acids), Poly unsaturated fatty acids (Linoleic Acid) and saturated fats, Phytosterols, Antioxidants.

Advantages:- It consists of mono unsaturated fatty acids and Poly unsaturated fatty acids, its help in lower the LDL cholesterol levels.

It reduces the absorption of dietary cholesterol. Antioxidants help in protection of cells from oxidative damage. It consists of longer shelf life. It is used for skin, have moisturizing properties. Over consumption of oil leads to weight gain.

Disadvantages :- As it is calorie dense, over consumption leads to weight gain if not balanced in calorie intake. Excessive intake of oil leads to inflammation of the body it may lead to allergic reactions.

SESAME OIL: It consists of unsaturated fats including mono unsaturated fatty acids and poly unsaturated fatty acids, antioxidants, vitamins, minerals and Phytochemicals.

Advantages :- It is rich in aromatic flavour. Unsaturated fats lead to oxidative stress and inflammation. Phytosterols help to lower the LDL cholesterol levels when consumed as a part of balanced diet. Antioxidants help to protect cells from damage caused by free radicals. It is used for skin care and health care products due to moisturising property. It is used in traditional medicine for massage oil and oil pulling. It has long shelf life.

Disadvantages :- As it is a calorie-dense oil, over consumption leads to weight gain excessive intake of oil leads to inflammation in the body. It should be stored in cool, dark place to prevent from rancidity.

SUN FLOWER OIL: It consists of unsaturated fatty acids vitamin E Phyto sterols.

Advantages :- It has high smoke point, which makes suitable for high heat cooking methods. It has mild and neutral flavour. Omega 6 Fatty acids leads to increase the heart diseases. Antioxidants prevent cells from oxidative damage. Phyto sterols leads to lower the LDL cholesterol levels in the body. It has longer shelf life.

Disadvantages: Imbalance of omega 6 fatty acids in diet leads to inflammation. It must be stored in cool and dark place to avoid from rancidity. As it is a calorie dense oil, overconsumption leads to weight gain. Some individuals may be allergic to seed or oil, so they must be cautious while taking food.

II. CONCLUSION

Review on various edible oils has been presented and their benefits and harmful effects

have been discussed. Out of different edible oils available Olive oil and Coconut oil appear to be most healthy oils. Olive oil consist of highest content of MUFA (75%) among all the oils, it is used to treat heart diseases, inflammation, antihypertensive, etc. Coconut oil consist of SFA along with MUFA and PUFA, chief contributor is Lauric acid (45%). It is used to treat heart diseases and has antioxidant activity. Palm oil consist of SFAs and UNSFAs, major contents are palmitic acid, linoleic acid, etc. its used to heart diseases. Safflower oil consist of high PUFA (linoleic acid), low MUFA (13%). It is used to treated heart diseases by lowering the LDL cholesterol levels. Sunflower oil consist of high PUFA and omega-6-polyunsaturated fatty acids. It is used to treat heart diseases, inflammation, etc. Rice bran oil consist of MUFA (47%), PUFA, SFAs, It is used to treat heart diseases, has antioxidant activity. Groundnut oil consist of MUFA (oleic acid), PUFA (linoleic acid), SFA (palmitic acid), these fats should be balanced properly in diet, Overconsumption of any edible oils leads to increases in cholesterol levels, which leads to heart diseases, weight gain. Some people who are sensitive may be prone to allergic reactions. Hence, edible oils are used for cooking at high temperatures.

ABBREVIATIONS :

MUFA: Monounsaturated fatty acids

PUFA : Polyunsaturated fatty acids

SFA: Saturated fatty acids

O6FA: Omega -6-fatty acids

CHO: Cholesterol

TAGs : Triacylglycerols

TGs: Triglycerides

FAs: Free fatty acids

CAD: coronary artery disease

LDL: Low density lipoprotein

HDL: High density lipoprotein

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