Popular Article

e-ISSN: 2583-0147

Volume 2 Issue 4
Page: 0128 – 0132

Lora Anusha .P
PhD scholar
Department of Crop Physiology
Acharya N.G Ranga Agricultural University working at IIOR
Hyderabad, India

Ratnakumar Pasala
Principal scientist
Dept. of Plant Physiology, IIOR
Hyderabad, India

Praduman Yadav
Senior Scientist
Dept. of Biochemistry, IIOR
Hyderabad, India

Sandhya Rani .P
Professor and Head
Dept. of Crop Physiology
Acharya N.G Ranga Agricultural University, LAM, Guntur
Andhra Pradesh, India

Umamahesh .V
Associate Professor
Dept. of Crop Physiology
Acharya N.G Ranga Agricultural University, LAM, Guntur
Andhra Pradesh, India

Krishna Teja .I
Assistant professor
Department of Agricultural Economics
PJTSAU, Hyderabad
India

Corresponding Author
Lora Anusha .P
loraanu55@gmail.com

Role of Plant Based Edible Oils for Human Diet

In India there are seven edible oil seed crops, namely groundnut, rapeseed & mustard, soybean, sunflower, sesame, safflower and niger, blessed by the benefit of the diverse agro-climatic areas. Oilseeds are important segment of tropical agriculture as they provide access to nutrition through protein and oil to humans and livestock. Edible oils are crucial for human nutrition, as they are energy dense with a high fat content. Human body needs some of the vital acids like Poly Unsaturated Fatty Acids (PUFA), which are not synthesized by the human body on its own, which obligates us to take from external sources. As vegetable oils are excellent source for PUFA, Mono-unsaturated fatty acids, Vitamins and others, an attempt was made to highlight the core health benefits of major vegetable oils.

INTRODUCTION

India has a well-developed oil-based industry that employs over 15 million people. Oil seeds not only provide vital calories to the country's population, but they also keep the milling industries successful. Oilseed crops are important for human diet after cereals, which provide 2.5 times more energy than proteins and carbohydrates. There is 4.1 percent annual growth rate over the last three decades in the oilseed sector and it has remained dynamic worldwide. An oil seed contributes to 13% of the grown gross area in India, 3 per cent of the gross national product and 10 per cent of the value of all agricultural products. The per capita food consumption (kcal/person/day) is projected to be 2980 by 2050 with 38% contribution from oil products (Babu *et al.,* 2013), which sensitize the interest to know the role of vegetable edible oils in human health. Thus, the brief role of major vegetable edible oils in human health is presented under the following heads.

GROUNDNUT OIL

Groundnut oil is abundant in monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA) and low in saturated fats, it reduces an individual's risk of

cardiovascular ailments by decreasing low density lipoprotein cholesterol, lowering serum triglycerides and maintaining high density lipoprotein cholesterol levels in human blood plasma. Greater intake of PUFA from groundnut oil may increase insulin sensitivity and mitigate the risk of developing type-2 diabetes in women. This oil is also a source of natural occurring compounds *viz.,* vitamin E, antioxidants, phytosterols, myoinositol, squalene, and p-coumaric acid, which are helpful in maintaining good health. Increased oral/dietary intake of myoinositol from peanut oil significantly improves nerve function of diabetic patient. Phytosterols (beta sitosterol, campesterols and stigmasterol) in groundnut oil limits the absorption of cholesterol from the diet. Evolving evidence is showing that, they also reduces the inflammation and limits the growth of various cancers i.e. ovarian, lung, stomach, prostrate, prostrate, breast and colon cancer (Mahatma et al., 2016).

SESAME OIL

Sesame seed oil has been used by humans since the dawn of civilization as healing oil. In the event of urinary disorders, this oil is used twice a day. Sesame oil works against numerous forms of bowel diseases, particularly diarrhea and dysentery. Sesame oil is also used for ear ache and treating ear secretions. This oil is regularly applied to the scalp and massaged well to avoid hair falling and supports long hair life. This oil is also used for the treatment of dry cough, asthma, lung disease, inflammation, ulcers, urinary diseases, vertigo and migraine. It is used for the prevention and treatment of prostatic illnesses. It is also quoted in the literature that, a spoonful of oil is administered twice a day for 2-3 months to treat prostatitis. (Mukta and Neeta, 2017). Many research studies revealed that, sesame oil, which is rich in PUFA, sesamin and vitamin E reduced

hypertension significantly compared with drugs which lower blood pressure. The sesamum seed oil contain sesaminol and sesaminol gamma tocopherols, which are similar to the activity of vitamin E. Sesame oil is regarded as an anti-bacterial mouthwash in Ayurvedic science and it can also be used to relieve insomnia and anxiety. Premenstrual pain can be overcome by applying the oil in the abdominal region (Prasad *et al.,* 2012).

SUNFLOWER OIL

Sunflower oil has attracted the human interest due to its higher content of oleic and linoleic acid that is

found to reduce the cholesterols, leading to reduction in heart ailments. Tocopherols in sunflower oil shield the body from inflammation and tumors by counteracting free radicals and evading oxidative damage to the cells, thus aids in diseases like

bronchial asthma and rheumatoid arthritis. This oil contains magnesium that is helpful for curing hypertension and migraine along with maintaining muscular tone of the body. Several components in sunflower oil make it curative as, anti-bacterial, anti-inflammatory, anti-fungal, anti-carcinogenic, cardioprotective and dermoprotective in human body. Defense system against ROS (reactive oxygen species) is strengthened by the presence of Vitamin E component in this oil *i.e.,* α-Tocopherol, facilitating oxidation of polyunsaturated fatty acids (Khan *et al*., 2015). Sunflower oil contains vitamin E, unsaturated fatty acids, antioxidants, tocotrienols and tocopherols, phenolics, phytosterols and carotenoids. So, it is having nutraceutical features. It is a known fact that, free radicals generated in the human body system through smoking, stress, ingestion of contaminated food and water, and other environmental factors that degenerate into disease conditions such as cardiovascular disease and cancer. Foods rich in antioxidants are very important to avoid serious body damage. Antioxidants such as carotenoids and tocopherols found in sunflower oil neutralize free radicals, scavenge them and avoid oxidative damage to cells or tissues, thus exhibiting cardio-protective, anti-tumor and anti-inflammatory and responses (Adeleke and Babalola, 2020).

SAFFLOWER OIL

Safflower oil has ample nutritional value and consists of 70 per cent polyunsaturated fatty acid (i.e., linoleic acid), 10% monounsaturated oleic acid, and meager

amounts of stearic acid. This oil contains large amounts of polyunsaturated fatty acids, which are important in managing the cholesterol level in blood. This oil is non-allergenic and appropriate in administering medicines by injection. (Delshad *et al*., 2018). High oleic safflower oil has high oxidative stability, which makes it suitable for prolonged and deep frying. High single point unsaturation makes oleic safflower oil suitable for a series of chemical reactions. Hence, the demand for this oil is increasing in the oleochemical industry to modify into a wide range of chemical products for use inks, paints, lubricants, bio-fuels, cosmetic products, detergents and bio-based plastics. Indian institute of oilseeds research developed three lines ISF-1, ISF-2 and ISF-3, which possess high levels of oleic acids. (Anjani and Praduman Yadav, 2017). These lines are very helpful in widening the scope of the safflower oil in varied industries. This oil is presently used as a thermogenic compound and for the treatment of problems related to the cardiovascular system. This oil has the capacity to ease rheumatic pains and relieve constipation and thus, it has laxative and antifungal properties. This oil comprises a high content of polyunsaturated linoleic acids and monounsaturated oleic acid, which are crucial in nutritional as well as medicinal uses, due to its pharmacological properties. This oil supplies Linoleic acid, which is not synthesized by the human body and should therefore be consumed externally through the diet. In research studies, this oil showed significant antiulcer activity, when administered at a dose of 187.5 mg/kg orally and intraduodenally. Its anti-ulcerogenic activity could be attributed to the existence of linoleic acid (Toma *et al*., 2014)

RAPESEED AND MUSTARD OIL

Mustard oil is reported to be protective to the patients

having acute myocardial infarction, possibly due to the presence of α-linolenic acid. It was found that the omega-3 PUFA present in rapeseed/mustard oil lowers the risk of chemically induced cancer. Mustard oil contains high iodin, tocopherol and peroxide

values. It is found to be a good choice for coronary heart disease patients as it has considerably low levels of erucic acid than canola oil, which is responsible of increased cholesterol (Khansili and Rattu, 2017).

Mustard oil contains little amount of saturated fatty acids and equivalent proportion of PUFA and MUFA. The health beneficial property of this oil is, it raises the good HDL cholesterol ratio and Omega-3 fatty acid, which helps in reduction of the risk of chemically induced cancer. This oil also contains phytosterols, tocopherol, vitamin K, natural antioxidants, and some polyphenols which has anti-fungal, anti-bacterial and anti-carcinogenic properties. This oil is appropriate for all types of cooking including frying, but it is recommended to use it along with the other cooking oils in order to reduce the erucic acid content (Swati *et al*., 2015).

NIGER OIL

Niger seed oil is regarded to be nutritionally useful due to its high linoleic acid content, which is believed to prevent cardiovascular disease and to be a precursor of structural components of plasma membranes and some metabolic regulatory

compounds. Linoleic acid reduces LDL cholesterol while having little effect on HDL cholesterol. Linoleic acid and other n-6 fatty acids have also been linked to proinflammatory or prothrombotic properties. Linoleic acid can also help with arrhythmias and insulin sensitivity. The high level of vitamin K_1 (Phylloquinone) in niger seed oil may be its most distinguishing health-promoting factor. Vitamin K_1 is a fat-soluble vitamin that functions as a coenzyme in the synthesis of many proteins that are helpful in blood clotting and bone metabolism. Vitamin K_1's importance has recently quoted frequently as it is also helpful in reducing the risk of cardiovascular diseases, anti-carcinogenic and skin health enhancer (Ramadan, 2014).

SOYBEAN OIL

Soybean oil contains high proportions of the linoleic acid, linolenic acid and polyunsaturated fatty acids. Soybean oil with enhanced omega-3 fatty acid levels have value in both feed and food applications.

It contains various phytochemicals like sterols. The key sterols found in soybeans are stigmasterol and sitosterol. Minor components such as campesterol, stigmasterol, Δ7-avenasterol, and brassicasterol are also present in soybeans. These phytosterols have a cholesterol reducing effect by interfering with the absorption of cholesterol in the blood serum. This oil also encompasses α, γ, and δ tocopherols (vitamin E), which acts as antioxidants, which scavenges the free radicals (Ahmad *et al.,* 2014).

CONCLUSION

Fats and oils are vital nutrients that account for approximately 40% of the calories in the average person's diet. Oilseeds and their derivatives are high in PUFA, despite their high fat content and energy density, oilseeds and the products made from them, primarily vegetable oils, play a key role in a healthy balanced diet. They are especially high in vitamins D and E, and they also contribute to high levels of vitamin A. They can help in lowering the LDL cholesterol by replacing saturated fatty acids in the diet. Every plant based edible oil is beneficial to human health in its own and unique way.

REFERENCES

Adeleke, B.S and Babalola, O.O. 2020. Oilseed crop sunflower (*Helianthus annuus*) as a source of food: Nutritional and health benefits. *Food Science and Nutrition*.8: 4666-4684.

Ahmad, A., Hayat, I., Arif, S., Masud, T., Khalid, N & Ahmed, A. 2014. Mechanisms Involved in the Therapeutic Effects of Soybean (*Glycine Max*). *International Journal of Food Properties*. 17:1332–1354.

Anjani, K and Praduman Yadav. 2017. High yielding-high oleic non-genetically modified Indian safflower cultivars. *Industrial Crops and Products*. 104 : 7-12.

Babu, S.N.S., Rao, S.V.R., Kumar, V.D., Pati, D., Sujatha, M and Varaprasad, K. 2013. Vision 2050 of ICAR- Directorate of Oilseeds Research. Hyderabad, A.P.

Delshad, E., Yousefi, M., Sasannezhad, P., Rakhshandeh, H and Ayati. Z. 2018. Medical uses of *Carthamus tinctorius* L. (Safflower): a comprehensive review from Traditional Medicine to Modern Medicine. *Electronic Physician*. 10 (4): 6672-6681.

Khan, S., Choudhary, S., Pandey, M., Khan, M.K and Thomas, G. 2015. Sunflower Oil: Efficient Oil Source for Human Consumption. *Emer Life Science Research*. 1(1): 1-3.

Khansili, N and Rattu, G. 2017. A comparative study of hidden characteristics of canola & mustard oil. *International Journal of Chemical Studies*. 5(3): 632-635

Mahatma, M. K., Thawait, L. K., Bishi, S. K., Khatediya, N., Rathnakumar A. L., Lalwani, H. B and Misra, J.B. 2016. Nutritional composition and antioxidant activity of Spanish and Virginia groundnuts (*Arachis hypogaea* L.): A comparative study. *Journal of Food Science and Technology*. 53(5): 2279-2286.

Mukta, N and Neeta, P.M. 2017. A review on sesame an ethno medicinally significant oil crop. *International Journal on Life Science and Pharma Research*. 7(2): 58-63.

Prasad, M.N., Sanjay, K.R., Prasad, D.S., Vijay, N., Kothari, R and Swamy S.N. 2012. A review on nutritional and nutraceutical properties of Sesame. *Journal of Nutrition and Food Sciences*. 2(2): 1-6.

Ramadan, M.F. 2014. Functional properties, nutritional value, and industrial applications of Niger oilseeds (*Guizotia abyssinica* Cass.). *Critical Reviews in Food Science and Nutrition*. 52(1): 1-8.

Swati, Sehwag, S and Das, M.S. 2015. A brief overview: Present status on utilization of mustard oil and cake. *Indian Journal of Traditional Knowledge*. 14(2): 244-250.

Toma, W., Guimaraes, L.L., Brito, A.R.M.S, Santos, A.R., Cortez, F.S., Pusceddu, F.H, Cesar,A., Junior, L.S., Pachecoa, M.T.T and Pereira, C.D.S. 2014. Safflower oil: an integrated assessment of phytochemistry, anti-ulcerogenic activity, and rodent and environmental toxicity. *Revista Brasileira de Farmacognosia*. 24: 538-544.