



SELECTION OF EDIBLE OIL FOR COOKING

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Submission Date : 05-09-2019

Revision Date: 07-09-2019

Publication Date: 20-09-2019

**All authors declare no
conflict of interest.**

This editorial may be cited as: Sadiq
Z, Noeman A. Selection of edible
oil for cooking. (J Cardiovasc Dis
2019;15(1):1 - 2)

In this new era, the developing world is facing a challenge of increasing incidence of coronary heart disease (CHD), which is the leading cause of death all over the globe. Fat contents of diet play a crucial role in promoting or preventing CHD. Initially it was emphasized to decrease the amount of fat intake, but new researches shows that type of dietary fat is more important than total fat intake¹, as recommended by 2015 Dietary Guidelines Advisory Committee². Cooking oils are the integral part of diets. Therefore, selection of healthy edible oil is very important.

Edible oils can be classified in various ways.

A) On basis of fatty acid contents can be divided into, 1) Saturated fatty acids (SFA), 2) Monounsaturated (MUFA), 3) polyunsaturated (PUFA) (Further classified as omega-3; alpha-linolenic acid, omega-6; linolenic acid), 4) trans fatty acids (TFA) which are produced by hydrogenation of vegetable oils (vanaspati ghee).

B) essential (cannot be synthesized in liver e.g. omega-3 and omega-6) and non essentials e.g. saturated and monounsaturated fats.

C) can be grouped according to the extraction process like cold or heat pressed oils.

D) on basis of smoke points and heat stability.

SFA, chief source of which are dairy foods, red meat and some plants oils like coconut and palm oils are considered as harmful, as they can increase cholesterol and may increase the risk of CHD³. MUFAs mainly extracted from canola and olive oils may lower LDL and triglycerides (TGL). Probably has no association with CHD⁴. PUFAs; omega-6, chief source of which are sunflower, safflower and corn oils may reduce risk of CHD as these not only can lower LDL and TGL but also increase HDL⁵. PUFAs; omega-3 main source of which are canola, soyabean, flaxseed, walnut oils and tuna fish may reduce CHD⁶ as they can decrease LDL, TGL and maintain HDL cholesterol. omega-6 and omega-3 are essential fatty acids and are required for proper functioning of body. Trans fatty acids from partially hydrogenated oils are considered harmful as they increase LDL and lower HDL⁷.

Oils which are used in cooking are mainly extracted from seeds, vegetables, fruits and nuts. Cold press Extraction of oil involves crushing and pressing the seed or nut like commercially available extra virgin olive oil. The hot press process uses heat to extract oil, although it produces more oil but at expense of degrading the nutritional quality as well as loss of antioxidants like tocopherols and phosphatides. Smoke point of an oil is the temperature at which oil starts to burn leading to degradation of nutrients and antioxidants⁸. After smoke points are flash points at

(J Cardiovasc Dis 2019;15(1):1 - 2)



which vapors are formed at about 270-330°C. If the vapors catches fire and burn, it means the oil is reached to the fire point. The smoke point of oils usually depends upon its extraction and refining process, higher smoke points results from impurities and free fatty acids removal⁸. So, the cold pressed oils have lower smoke points as compared to the refined or heat pressed oils, as in these oils naturally occurring phytochemicals like Vitamin E and plant sterols are preserved. In result, these oils cannot be used for deep frying.

Olive oil intake reduces CHD as indicated by several studies⁹. Due to its high polyphenolic components it decreases the oxidative stress markers¹⁰. However it does not have ideal omega-3 and omega-6 ratio. Canola oil which has this ideal ratio makes it cardioprotective¹¹ and has a smoke point of upto 225°C which makes it relatively heat stable for deep frying purpose¹². Sunflower oil is rich in omega-6 but deficient in omega-3. Flaxseed oil is enriched with omega-3. Mustard oil is considered as healthy oil¹³ as it has low SFA

and high in omega-3 and omega-6 and can be used for cooking at high temperatures. Blending of two or more oils can confer more balanced ratio of fatty acids, antioxidants and thermal stability. For example, canola oil blend with flaxseed oil effectively reduces the LDL and E-selectin (involved in inflammation and atherogenesis).¹⁴

To conclude, oil selection depends upon its contents and cooking conditions. During stir-frying, oil is subjected to higher temperature which may destroys antioxidants and produces harmful free radicals. So, it is advisable to use heat stable oils like canola and mustard oils for deep frying purpose due to their favorable contents and relatively better heat stability by virtue of their higher smoke points. Appropriate blended oils are other options for this type of cooking. Cold pressed oils like extra virgin olive oil should be used in salads or cooking at low temperatures due to their low smoking points. Repeated frying of oil should also be avoided as this practice damages the oil and produces toxic components.

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