

## Pragmatic selection of cooking oils

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### Abstract

Fats and oils are one of the very important components of diet. However excess of either overall fat or certain kind of fats in the diet may result in negative health impacts including risk of obesity, dyslipidaemia, cardiovascular diseases and certain malignancies. It is thus important to have an optimum amount of fat in the diet, and also important to choose appropriate sources of fat in the diet. In this mini review we suggest pragmatic selection of cooking oils for optimum health benefits.

**Keywords:** Fats, Cooking oils, Diet.

### Introduction

Fats and oils induce satiety, provide energy value, provide essential fatty acids {such as linoleic n-6 (LA n-6) and alpha-linolenic n-3 (ALA n-3)} and promote absorption of fat-soluble vitamins (A, D, E and K). Fat enhances texture, taste and flavour of food and is also the precursor of many biologically active compounds in the body.

Fatty acids are building blocks of various lipids classified as saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA). Current evidence indicates that high intake of SFA and trans-fatty acids (TFA) may increase serum total and low density lipoprotein (LDL) cholesterol levels, reduce insulin sensitivity, enhance thrombogenicity and increase cardiovascular risk. Therefore, it is essential to limit the intake of fats rich in SFA and TFA such as vanaspati.<sup>1,2</sup>

MUFAs can lower serum triglyceride levels and improve disorders of glucose metabolism.<sup>3</sup> PUFAs are essential components of cell membranes. Nerve tissue has high levels of long chain n-3 PUFA. PUFAs particularly n-3 increases insulin sensitivity, increase peripheral glucose utilization and decrease adiposity. The long chain n-3 PUFA of fish oils and micro algae have greater antiatherogenic, antithrombotic and anti-inflammatory effects than alpha-linolenic (n-3) acid of plant foods which are also important for vision and brain growth. High intake of n-6 PUFA in the diet decrease plasma

cholesterol as well as high density lipoprotein (HDL) cholesterol level.<sup>4,5</sup>

An appropriate balance of n-6 and n-3 fatty acids is essential in the diet for the optimum functioning of vascular, immune, nervous and renal systems and for early human development.

The plant oils, in addition, contain certain useful substances such as lignans (sesame oil), sterols, tocopherols (vitamin E) oryzanole and tocotrienols (rice bran oil), carotenoids which acts as antioxidants, and reduces blood cholesterol and inflammation.

### Sources of fat and types of cooking oils in the market

Dietary fats are derived from plant and animal sources. Oils from different sources differ in fatty acid composition (Table-1). Linoleic (n-6) and alpha-linolenic (n-3) acids,

**Table-1:** Approximate fatty acid composition of dietary fats and oils commonly used in cooking (% of total fatty acids).

Cooking fats/oils	SFAs	MUFAs	LA	ALA
<b>High SFAs</b>				
Coconut	92	6	2	-
Palm Kernel	83	15	2	-
Butter/ghee	68	29	2	1
<b>High SFAs and MUFAs</b>				
Palmolein	39	46	22	<0.5
<b>High MUFAs and moderate LA</b>				
Groundnut	19	41	32	<0.5
Rice Bran	17	43	38	1
Sesame	16	41	42	<0.5
<b>High LA</b>				
Cottonseed	24	29	48	1
Corn	12	35	50	1
Safflower	9	13	75	-
Sunflower	12	22	62	-
<b>High ALA and moderate LA</b>				
Soyabean	14	24	53	7
Canola	6	60	22	10
Mustard/Rapeseed	4	65	15	14
Flaxseed	10	21	16	53
<b>High TFAs</b>				
Vanaspati	46	49	4	-

\* SFA= saturated fatty acids, MUFA= monounsaturated fatty acids, LA= linoleic acid, ALA=alpha-linolenic acid, TFA= trans fatty acids.

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obtained from plant foods, contribute to PUFA in the diet. All vegetable oils (except coconut) are good sources of linoleic (n-6) acid. Vegetable oils also do not contain cholesterol. Soyabean, rapeseed and mustard oils contribute significant proportion of linolenic (n-3) acid. Fish and fish oils provide long chain n-3 fatty acids, which are biologically more active than alpha-linolenic (n-3) acid present in plant foods. Refining of oils modifies the composition of minor components, for example, carotenes are lost during refining of crude palm oil.

### Optimum amount of cooking oil

Fat should contribute 20-30% of total calories per person per day.<sup>2</sup> For a common man consuming 1800 kcal/day, daily fat intake should be 40-60 grams/day with approximately 20-30 gram from cooking oil (visible fat). It accounts for 600-900 grams/ month depending on to age, physical activity and physiological status.<sup>4</sup>

### Selection of cooking oils

An ideal quality oil/fat for good health is the one which maintains a balance, so as to give a ratio of PUFA/SFA to 0.8-1.0, and linoleic/ a-linolenic (n-6/ n-3) of 5-10 in the total diet. The intake of PUFA should be 8-10% of energy intake. The remaining 8-10% of fat calories can be derived from mono-unsaturated fatty acids, which also help in maintaining plasma cholesterol. The intake of trans fatty acids should not exceed 1% of energy intake and SFA intake should not exceed 8-10% of total energy.

Use of ghee, butter, vanaspati should be in moderation.

**Table-2:** Choosing combination of cooking oils.

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#### Oil containing LA + oil containing LA and ALA

- ◆ Groundnut/ Sesame/ Rice Bran/ Cottonseed + Mustard/ Rapeseed
- ◆ Groundnut/ Sesame/ Rice Bran/ Cottonseed + Canola
- ◆ Groundnut/ Sesame/ Rice Bran/ Cottonseed + Soyabean
- ◆ Safflower/ Sunflower + Palm oil/ Palmolein + Mustard/ Rapeseed

#### Oil containing high LA + oil containing moderate or low LA

- ◆ Safflower/ Sunflower + Palmolein/ Palm oil/ Olive
  - ◆ Safflower/ Sunflower + Groundnut/ Sesame/ Rice Bran/ Cottonseed
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LA= linoleic acid, ALA=alpha-linolenic acid.

Partially hydrogenated vegetable oils and hydrogenated oil (used in ready-to-eat fast foods, bakery foods and processed foods) should be avoided as a medium of cooking/frying.<sup>6</sup> They should be replaced with oils of higher thermal stability like palm oil/ palmolein, sesame, rice bran, and cottonseed oil. Reheating of fats and oils should be avoided.<sup>7</sup> For ensuring this appropriate balance of fatty acids in cereal-based diets, it is necessary to increase the a-linolenic (n-3) acid intake and reduce the quantity of linoleic (n-6) acid obtained from the cooking oil. Suggested combination of cooking oils for a family is shown in Table 2.

### Conclusion

The judicious selection of cooking oil ensures consumption of good proportion of all fatty acids for optimal health benefits. Combination of cooking oils in different proportion rather than single cooking oil is suggested to keep a balance of various fatty acids in the diet. Also knowledge of composition of various oils is important to plan cooking oil sources for the patients and their families.

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