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Cooking Oils – Striking the right balance

In the last few issues our primary focus was 'Food'. Food would be purposeful and meaningful when basic concerns of nutrition is answered and understood simultaneously. So we had endeavoured to keep our readers informed on 'Micro-nutrient Fortification of Food', 'Food Allergies and Intolerances', 'Food additives – their role and guidelines', and 'Safe Food – their role and guidelines', and we now move on to different types of foods. We begin with cooking oils. Of the three macro-nutrients which are ingested for producing energy, oils and fats assume great importance. While on the one hand lipids are calorie dense, they do have their own owes if not used in right proportions. Of all the plethora of reasons for the onset of undesirable ailments, it is the paradigm shift in lifestyle and dietary changes that is the prime reason. It might be an ancient concept that restricted humans with its strictures specifying what to eat and recommended moderation. But in the modern day, adopting alien systems might be thrilling to the mind, but the body does not co-operate with such changes. Food is a typical example.

We knew the relevance of fats in our diet but recent research on classifying them and apportioning its rightful due has been brought out very lucidly by Dr. Sushila Sharangdhar in this issue. She has covered every aspect of fats and their sources. The different cooking media and their comparative properties are given on a platter for our readers to make right decisions when they use any of them. To complement this article, Dr. Shweta Rastogi has highlighted one particular lifestyle disorder which can be kept at bay by discretionary use of proper food. She emphasises on effective lifestyle modification to prevent stage I hypertension by eating the right type of food and particularly keeping a watch on the intake of total calories and portion sizes. We, at 'The Foundation,' hope our readers benefit from these articles.



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CHOICE OF COOKING OILS - STRIKING THE RIGHT BALANCE



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INTRODUCTION

India is already known as the diabetic capital of the world. At 50.8 million, the country currently has the highest number of people suffering from diabetes (China-43.2 million, US-26.8 million). By 2010 almost seven per cent of India's adult population will have the disease. The World Health Organization (WHO) estimates that 60 per cent of the world's cardiac patients will be Indians by 2010. We not only have the upcoming obesity epidemic but there's also a marked increase in cancers among the population.

Talking about diet, the major culprit is 'FATS', especially for what it has done to our waistline and heart! Eating the right kind of fat is a critical issue as dietary fat gets much of the blame for causing coronary artery disease. Fats and oils have different proportions of various fatty acids referred to as saturated(SF), monounsaturated(MUFA/oleic acid) or polyunsaturated(PUFA). A fat or oil usually contains all three types of

fatty acids, but is characterized by the fatty acid found in the largest amount. Plant oils are good sources of monounsaturated and polyunsaturated fats. Polyunsaturated fats include omega-6 and omega-3.

ESSENTIAL FATTY ACIDS

The body cannot make the PUFAs (omega-6s and omega-3s) that are found in plant and fish oils. These fats have essential roles in the body and should be supplied in the diet. The essential polyunsaturated fats are found in cell membranes and are converted to biologically active substances that play a role to help prevent many chronic diseases. These polyunsaturated fats, critical in the development of the central nervous system are found in high concentration in the brain and retina of the eye.

OMEGA-3 FATTY ACIDS (N3PUFA'S)

Omega-3 derived hormones include ones that regulate blood clotting, contraction and relaxation of artery walls and inflammation.

TYPE OF FATTY ACIDS	EFFECTS ON BLOOD LIPIDS
Saturated Fats	↑ total cholesterol, ↑ LDL cholesterol
Polyunsaturated Fats	PUFA ↓ total cholesterol, ↓ LDL cholesterol, ↓ HDL cholesterol*
Monounsaturated Fats	MUFA ↓ total cholesterol, ↓ LDL cholesterol, may ↑ HDL cholesterol *
Omega 3	↓ triglycerides, ↓ total cholesterol*
Trans Fats	↑ total cholesterol, ↑ LDL cholesterol, may ↓ HDL cholesterol

1) ADA, COMPLETE FOOD AND NUTRITION GUIDE, ROBERTA LARSON DUYFF, 2ND EDITION, 2002

*UNSATURATED FATTY ACIDS MAY HAVE A BENEFICIAL EFFECT IF THEY REPLACE SATURATED FATS, BUT NOT IF THEY'RE SIMPLY ADDED, MAKING THE DIET HIGHER IN FAT.

LDL-LOW DENSITY LIPOPROTEIN, HDL-HIGH DENSITY LIPOPROTEIN

They help reduce serum triglycerides and total cholesterol levels. Research has shown that these fats help prevent or treat heart disease and stroke. They may also help control eczema, lupus, and rheumatoid arthritis, and may also be protective against cancer and other conditions.

The three major types of omega-3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). ALA is found in vegetable oils (canola, flaxseed, and soybean), variety of seeds and nuts, green leafy vegetables, and beans. In the body, ALA is used mainly for energy but it is also transformed, in small amounts, into EPA and DHA. Fish oil and fatty fish such as salmon, mackerel, herring, and tuna are the primary sources of EPA and DHA (marine omega3s). The vegetarian source of DHA are algae oils. Most of the biological benefits attributed to omega-3 fat are from the long chain type found in fatty fish. The human body can convert 'plant-type' omega-3 to the 'fish-type.' But, the body's conversion to the longer-chain omega-3 fat is not efficient. Hence 'fish-type' omega-3 fat has a higher biological potency, but on a daily basis it is much easier to include oils containing 'plant-type' omega-3 (such as soybean, flaxseed and canola).

RESEARCH DATA

Over the years many compelling studies have shown potential health hazards of omega-6 fats (LA -Linoleic Acid) known to promote inflammation as being precursors of eicosanoids (prostaglandins, thromboxanes and leukotrienes). However in 2009, the American Heart Association (AHA) issued an advisory on the health benefits of omega-6 fats. (1b) The AHA's justification for promoting omega-6 PUFAs, is because of their ability to lower blood cholesterol, when eaten in the place of saturated fats. The AHA has made statements based on research but what about so many years of other documented compelling studies (as cited below -just few of so many) that shows the potential hazards of omega-6. No consideration on these? However, instead of going into controversies and debates, and focusing on omega-6, a wise step for those who want to reduce their heart disease risk would be to lower their intake of saturated fats and increase the omega-3 fatty acids in their diet.

- According to the Lyon Diet Heart study, people eating the Mediterranean diet had a striking 70 per cent reduction in all causes of death, including cancer, compared to those eating the 'heart healthy diet'.
- The incidence of cardiovascular disease has increased, in parallel, with the increase in linoleic acid intake in many countries. [Ghosh]
- Linoleic acid is the most commonly eaten omega-6 fatty acid. Notably, people who have died from heart disease have higher blood levels of the omega-6 fat, arachidonic acid. [Okuyama]
- Diets low in omega-6 fat, with high plant-based omega-3 fats, decreases the level of the potent omega-6 fat, arachidonic acid in the cell membranes of the heart. Furthermore, diets high in omega-6 fat influenced the enzymes in the heart responsible for increasing both inflammation and the availability of arachidonic acid. [Ghosh]
- Both dietary omega-6 fats, linoleic acid and arachidonic acid, were significantly associated with increased severity of atherosclerosis. [Dwyer]
- Framingham study, Tufts University [Lai] High dietary PUFA n-6 may not result in atherosclerosis protection.
- A study in Finland [Louheranta] showed that as the amount of linoleic (omega6) increased, so did the oxidation of LDL which makes it more hazardous to health.
- Studies from USA, France and Sweden demonstrate a link between high intakes of omega-6 fat and the development of breast cancer. [Tribole] [Wang]

RATIO OF OMEGA-6 TO OMEGA-3 FAT

Increased consumption of vegetable oils high in omega-6 fatty acids (such as corn, safflower, sunflower, and cottonseed oils) and meat from animals that were fed grains high in omega-6 fatty acids has drastically shifted the dietary ratio of omega-6 to omega-3 fatty acids from an estimated 1:1 in the early human diet to approximately 10:1 in the typical modern American diet. (14) Today's typical Indian diet and many diets around the world tend to contain 14 - 25 times more n6 than n3 fatty acids. The World Health Organization (WHO) recommends a n6:n3 ratio of 5-10:1. Getting the recommended

amount of omega-3 fat in the diet is more difficult since omega-3 is found in smaller amounts than omega-6 in most oils. As per recommended dietary guidelines of WHO/ Japanese Heart Association/ American Heart Association the ideal ratio of SFA: MUFA: PUFA should be 1:1.5:1.

The AHA concludes that Americans need to increase their intake of long-chain omega-3 FAs and that they should maintain (and possibly even increase) their intake of omega-6 FAs. For the omega-3 FAs, a healthy target intake is about 500 mg per day (whether from oily fish or fish oil capsules) and for linoleic acid, approximately 15 g per day (12 g for women and 17 g for men). Achieving healthy intake of both omega-6 and omega-3 FAs is an important component of nutritional prevention and treatment of coronary heart disease. (15)



Of all the diets in the world, the Mediterranean diet has a healthier balance between omega-3 and omega-6 fatty acids. Many studies have shown that people who follow this diet are less likely to develop heart disease. The Mediterranean diet does not include much meat (which is high in omega-6 fatty acids) and emphasises foods rich in omega-3 fatty acids, including whole grains, fresh fruits and vegetables, fish, olive oil, garlic, as well as moderate wine consumption.

CHOOSING THE RIGHT OIL

For a normal adult, WHO recommends 30 per cent calories in diet from fats. (SF less than 10 per cent, PUFA-8 per cent, MUFA-12 per cent) Whilst it's important to note that all oils are similar as per their calorie content, (9 calories/gram) and should be used only sparingly, as part of an otherwise healthy diet, the oils do differ in parameters like methods used for oil extraction, composition and heat tolerance. The methods used for extraction would determine whether an oil is refined (extracted from oil cakes involving solvent

extraction) or unrefined (cold pressed). Unrefined oils are considered better and recommended due to the presence of a wide range of bioactive compounds, flavours and Vitamin E content, which tend to prevent rancidity in them. The differences between fats/oils, flavour, mouth feel, smoke point, stability, shelf life, and health attributes {best n6:n3 ratio, more MUFA than PUFA, least amount of saturated fat, nil amount of trans fat} are related to the way the chains of carbon, hydrogen and oxygen atoms are hooked together.



salad dressings or for light sautéing and stir frying. Over the years, olive oil is still considered one of the best.

COMPOSITION OF DIFFERENT FATS

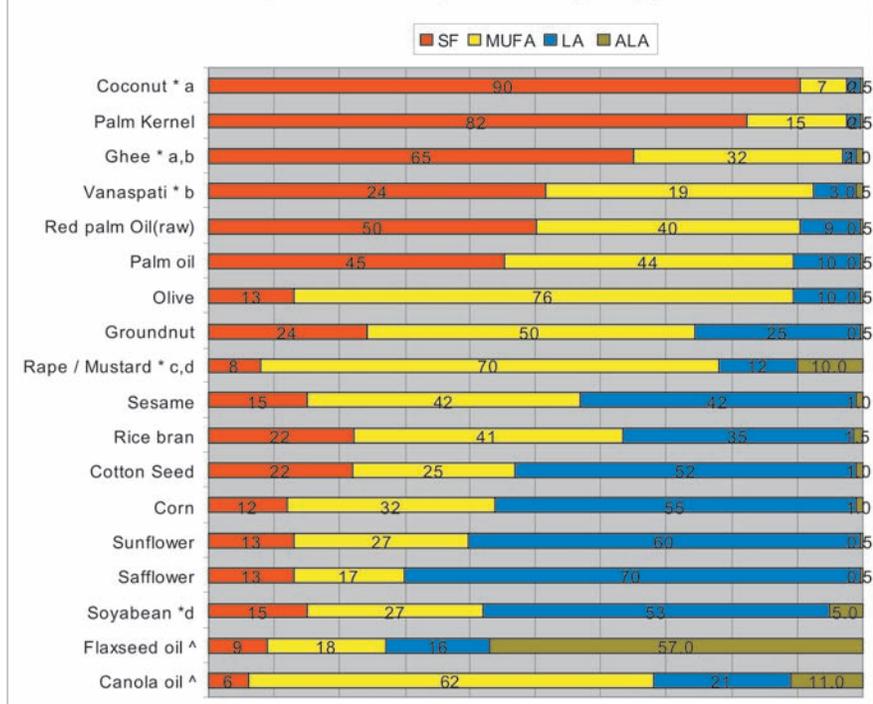
To determine the usefulness and appropriateness of different oils in preparing food, let us analyse their composition.

GROUNDNUT/PEANUT OIL (GNO) contains 50 per cent MUFA, 24 per cent saturated fat and 25 per cent omega-6 linoleic acid. Like olive oil, groundnut oil is relatively

antioxidants not destroyed by heat. However, the high percentage of omega-6 is again a major drawback.

Sesame oil (SO) is known to be stable against oxidative deterioration and its keeping quality is mainly attributed to the presence of endogenous unsaponifiable components such as sesamol, sesamol and sesamin (absent in other vegetable oils). A study conducted by Central Food Technological Research Institute (CFTRI), Mysore showed that sesame oil is very stable against oxidative deterioration compared to sunflower (SFO) and groundnut oils (GNO), at room temperature, over a period of time. Blending of SO with GNO and SFO increased the shelf life of blended oils at room temperature, and heated oils and the oxidative stability of blended oils. (2)

Comparison Of Dietary Fats & Oils (g/100 g.)



A: MAINLY SHORT AND MEDIUM CHAIN FATTY ACIDS (COCONUT 77 PER CENT, GHEE 25 PER CENT)

B: TRANS FATTY ACIDS (GHEE 2 PER CENT, VANASPATI 53 PER CENT)

C: LONG CHAIN MONOUNSATURATED FATTY ACIDS (50 PER CENT ERUCIC ACID AND 5 PER CENT EICOSENOIC ACID)

D: GOOD SOURCE OF ALPHA-LINOLEIC ACID

0.5 MEANS <0.5

ADAPTED FROM: DIET AND HEART DISEASE, GHAFOORUNISSA, KAMALA KRISHNASWAMY, NATIONAL INSTITUTE OF NUTRITION, ICMR, REPRINTED 1998 ^:FLAXSEED AND CANOLA OILS HAVE BEEN ADDED TO COMPARE WITH OTHER OILS.

OLIVE OIL contains 76 per cent MUFA, (highest of all the oils), 13 per cent saturated fat, 10 per cent omega-6 linoleic acid and less than 1 per cent omega-3 linolenic acid. The Extra virgin olive oil is also rich in antioxidants but it is cold pressed and has comparatively lower smoking point. Therefore it is best used as

stable. Again, it has a good percentage of omega-6, so the use of groundnut oil should be limited.

SESAME OIL contains 42 per cent MUFA, 15 per cent saturated fat, and 42 per cent omega-6 linoleic acid. Similar in composition to groundnut oil, it can be used for frying because it contains unique

CORN, SAFFLOWER, SUNFLOWER, SOYBEAN AND COTTONSEED OILS all contain over 50 per cent omega-6. Only soybean oil has minimal amounts of omega-3. They all have much lesser MUFAs. Of these, Safflower oil contains the most omega-6 (70 per cent). Use of these oils should be strictly limited. They should never be consumed after they have been heated, as in cooking, frying or baking. (13)

CANOLA OIL/RAPESEED/MUSTARD

These belong to one family. Canola oil contains 6 per cent saturated fat (the least among all commercially available oils), 62 per cent oleic acid, 21 per cent omega-6 and 10-15 per cent omega-3 (so high MUFA along with beneficial omega-3). The original rapeseed plant was high in erucic acid, which is an unpalatable fatty acid having negative health effects in high concentration. 'Canola' is a genetically altered and improved version of rapeseed. 'Canola' is a registered trademark of



Canadian Oil Association and contains less than 1 per cent erucic acid. Actually, another name for canola oil is LEAR (Low Erucic Acid Rapeseed) oil. In India, the 'Hyola' is only hybrid 'canola' quality *gobhi-sarson* notified by Govt. of India recently after extensive trials by Indian Council of Agricultural Research (I.C.A.R.).

The Indian *kachi ghani* mustard oil has a very close composition to canola oil (given below). It has antioxidants, allyl-isothiocyanates, phenolics (anti-bacterial properties), phytins and also absence of trans fatty acids (as it is cold pressed oil) and the presence of Vitamin E, makes the mustard oil heart healthy and one of the best oils for cooking.

N6:N3 COMPARISON RATIO OF DIFFERENT EDIBLE OILS

Fats/Oil	Saturated Fatty Acid (SFA)	Mono-unsaturated Fatty Acid (MUFA)	Linoleic Fatty Acid (PUFA), Omega 6	Alpha-Linolenic Fatty Acid (PUFA), Omega 3	Ratio of n6:n3	Predominant Fatty Acid
Mustard	8	70	12	10	6:5	MUFA
Soybean	15	27	53	5	10.6:1	PUFA
Palm Oil	45	44	10	<0.5	20:1	SFA+MUFA
Red Palm	50	40	9	<0.5	18:1	SFA+MUFA
Groundnut	24	50	25	<0.5	50:1	MUFA
Sunflower	13	27	60	<0.5	120:1	PUFA
Rice Bran	22	41	35	1.5	23:1	MUFA+PUFA

ADAPTED FROM DIET AND HEART DISEASE, GHAFOORUNISSA, KAMALA KRISHNASWAMY, NATIONAL INSTITUTE OF NUTRITION, ICMR, REPRINTED 1998

Ideally the ratio of n6:n3 should not exceed 10:1.

RICE BRAN OIL Rice bran oil (RBO) is not a popular oil worldwide, but it is in steady demand as a so-called 'healthy oil' not only in Japan but also in Asian countries, particularly India.

As shown above, RBO has a nonspecific fatty acid profile, but it does contain a detectable amount of- linolenic acid,

ranging from 1 to 3 per cent (mean value, 2 per cent). This amount may be enough to increase the content of (n-3) highly polyunsaturated fatty acids such as EPA and DHA in tissue phospholipids compared with other vegetable oils such as corn oil (Edwards and Radcliff, 1994). The remaining major fatty acid in RBO is palmitic acid, 17 per cent. Rice bran oil lowers serum total and low density lipoprotein cholesterol and apo B levels in nonhuman primates. (3)

BOTTOM OF FORM

In recent years, studies have indicated that Ferulic Acid (FA) found in cell walls, prevents LDL from oxidation, exhibits

inhibitory effects on tumor promotion, and protects against certain chronic diseases such as coronary heart disease and some cancers. (6) Numerous studies show rice bran oil reduces LDL without reducing good cholesterol- HDL. In those studies, Oryzanol is reported as the key element responsible for that function. Tocotrienol, on the other hand, is highlighted as the most precious and powerful vitamin E existing in nature and is said to have an anti-carcinogenic effect, too. As a Vitamin-E source, rice bran oil is rich not only in alpha Tocopherol but also has the highest amount of Tocotrienol in liquid form vegetable oils.

Suzuki and Oshima (1970a and b) studied the effect of blending different vegetable oils on serum cholesterol levels of healthy young women confirmed by Lichtenstein et al. (1994). (4) The most interesting observation was that the blend of seven parts of RBO with 3 parts of safflower oil unexpectedly enhanced the cholesterol-lowering potential of RBO.

FLAX SEED OIL contains 9 per cent saturated fatty acids, 18 per cent oleic acid, 16 per cent omega-6 and 57 per cent omega-3. Due to its extremely high omega-3 content, flax seed oil is an excellent top-up for the lack of n3 and n-6/n-3 imbalance that is globally prevalent today. New extraction and bottling methods have minimized rancidity problems. It should always be kept refrigerated, never heated, and consumed in small amounts in salad dressings and spreads. (13)

GHEE: Though *ghee* has a higher percentage of SFAs, a study on sixty three healthy physically active adult volunteers (52 men and 11 women) was conducted at AIIMS, New Delhi following a randomised controlled parallel design. The experimental group was provided *ghee* and mustard oil in diet for eight weeks. Their serum total cholesterol and HDL cholesterol level increased while LDL cholesterol level did not show any change. The study did not indicate any adverse effect of *ghee* on lipoprotein profile. (11) So it can be deduced from above that *Vanaspati* has high content of transfat and is thus best avoided.

CHICKEN FAT is about 31 per cent saturated, 49 per cent monounsaturated (including moderate amounts of antimicrobial palmitoleic acid) and 20 per cent polyunsaturated, most of which is omega-6 linoleic acid. (13)

MUTTON FAT is 50-55 per cent saturated, about 40 per cent monounsaturated and contains small amounts of polyunsaturates, usually less than 3 per cent. (13)

TROPICAL OILS are more saturated than other vegetable oils.

COCONUT OIL is 92 per cent saturated with over two-thirds of the saturated fat in the form of medium-chain fatty acids (MCT). Of particular interest is lauric acid, found in large quantities in both coconut oil and in mother's milk. This fatty acid has strong antifungal and antimicrobial properties. Coconut oil protects tropical populations from bacteria and fungus prevalent in their food supply; as third-world nations in tropical areas have switched to polyunsaturated vegetable oils, the incidence of intestinal disorders and immune deficiency diseases has increased



dramatically. (13) A report published in the American Soc. for Nutritional Sciences, showed that MCT may increase energy expenditure, result in faster satiety and facilitate weight control when included in the diet as a replacement for fats containing LCT (Long Chain Triglycerides). However, more work is required to establish whether prolonged consumption of MCT helps decrease in body weight or helps control weight gain.

PALM OIL is about 45 per cent saturated, with 44 per cent MUFA and about 10 per cent linoleic acid. Palm oil is known to be a major edible oil commodity in more than 132 countries worldwide.

Highly saturated tropical oils do not contribute to heart disease but have nourished healthy populations for millennia. (9) Human beings have been consuming saturated fats from animal products (meat, milk, and butter) and the tropical oils for thousands of years. Infact, it is the advent of modern processed vegetable oil accompanied with a lack of physical activity that is associated with the epidemic of modern degenerative disease. Due to the saturated fat scare, many prefer to abandon these fats in favour of hydrogenated soybean, corn, safflower and sunflower oils.

SUMMARY

No single oil has the optimum combination of the desired fatty acids. The best way is to use a variety of oils for different cooking preparation eg, olive oil for salads and light sautéing; canola, sesame, rice bran or groundnut oil for high temperature cooking, and sesame and mustard oil for other preparations. Let us derive inspiration from our ancestors and also use small quantity of traditional oils- ghee, coconut oil, and organic home made butter. Topping up on EFAs is best done through dietary measures such as nuts, seeds, soyabean (tofu), flaxseed, canola oil, and fish.

Also, blending oils as discussed above provide advantageous health benefits. Dr.Ghafoorunnisa, renowned lipid biochemist presented details of oil combinations which can promote better n-3 and n-6 ratios. (12)

Emphasis should be placed on MUFAs and on omega-3 PUFAs to replace both SFAs and omega-6 PUFAs. Omega-6 are definitely essential, however, in limited quantities.

Reusing oil minimally is fine so long as the fat is not rancid and deteriorated to the point it produces undesirable flavours and odors (at this point the oil contains free radicals that are potentially carcinogenic). Each time the oil is re-used, the smoke point gets lowered.

Last but not the least, for any good quality oil, the golden word is 'limit.'

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Nutrition in

DIETARY PATTERNS

There are two composite diets- vegetarian diets and DASH diet which are considered to lower pressure. These diets are highly practical and have presumed benefits for the prevention of chronic disease other than hypertension such as heart disease and cancer.

VEGETARIAN DIETS

Vegetarian diets have been associated with low BP. In industrialized countries, where elevated BP is commonplace, individuals who consume a vegetarian diet have markedly lower BPs than do non-vegetarians. In these observational studies, vegetarians also experience a lower age-related rise in BP. In general, vegetarian diets reduce blood pressure, although the specific nutrients responsible for this effect have not been identified. The DASH diet could easily be a vegetarian diet if legumes were substituted for meat. Vegetarian diets tend to be higher in potassium, magnesium, and calcium, as does the DASH diet. Vegetarian diets are, also, higher in fiber and unsaturated fats than other diets.

DASH DIET

DASH (Dietary Approaches to Stop Hypertension) is the most effective diet with clinical evidence. It emphasizes on fruits, vegetables, low fat dairy products, whole grains, poultry, fish and nuts, and reduced fats, red meat, sweets and sugar containing beverages.

DIETARY FACTORS WITH LIMITED OR UNCERTAIN EFFECT ON BP

Following dietary factors have been studied in various trials but as per AHA overall

TABLE 1: THE DASH DIET.

FOOD GROUP	DAILY SERVINGS
Grains and grain products	7 - 8
Vegetables	4 - 5
Fruits	4 - 5
Low-fat or fat free milk or milk products	2 - 3
Meats, poultry and fish	2 or less
Nuts, seeds and beans	4 - 5 a week

SOURCE: "A CLINICAL TRIAL OF THE EFFECTS OF DIETARY PATTERNS ON BLOOD

hypertension Part 2



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data is insufficient to recommend them useful for lowering of blood pressure. These include:

- Fish Oil Supplementation (Omega 3 PUFA)
- Fiber
- Calcium and Magnesium
- Carbohydrate
- Saturated fat
- Omega-6 Polyunsaturated Fat Intake
- Monounsaturated Fat Intake

- Protein Intake
- Cholesterol
- Vitamin C

PREVENTION

The Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC 7) recommends lifestyle changes as the best way to prevent or delay the onset of hypertension. The Trials of Hypertension

Prevention (TOHP) showed that there is a potential for delaying the onset of hypertension through dietary means such as weight loss and salt restriction.

Guidelines of the seventh report of the JNC-7 for treating all stages of hypertension with or without concomitant antihypertensive medication:

JNC-7 Lifestyle Recommendations for preventing and treating hypertension-

- Maintain a normal body weight or lose weight if body mass index is 24.9 kg/m²
- Reduce sodium intake to 2.4 g (6g salt) or less per day
- Limit alcohol intake to two drinks or less per day for men and 1 drink for women (1 drink = 14 g of ethanol, contained in 12 oz beer, 5 oz wine or 1.5 oz distilled spirits).
- Eat a dietary pattern that is high in fruits, vegetables, and low fat dairy and lower in fat, saturated fat, and cholesterol (DASH dietary pattern)
- Engage in moderate level aerobic physical activity, 30 min/day, most days of the week.

TABLE 2: EFFECTS OF DIETARY FACTORS AND DIETARY PATTERNS ON BP: A SUMMARY OF THE EVIDENCE

	HYPOTHESIZED EFFECT	EVIDENCE
Weight	Direct	++
Sodium chloride (salt)	Direct	++
Potassium	Inverse	++
Magnesium	Inverse	+/-
Calcium	Inverse	+/-
Alcohol	Direct	++
FAT		
Saturated fat	Direct	+/-
Omega-3 polyunsaturated fat	Inverse	++
Omega-6 polyunsaturated fat	Inverse	+/-
Monounsaturated fat	Inverse	+
PROTEIN		
Total protein	Uncertain	+
Vegetable protein	Inverse	+
Animal protein	Uncertain	+/-
Carbohydrate	Direct	+
Fiber	Inverse	+
Cholesterol	Direct	+/-
DIETARY PATTERNS		
Vegetarian diets	Inverse	++
DASH-type dietary patterns	Inverse	++

+/_ INDICATES LIMITED OR EQUIVOCAL EVIDENCE; +, SUGGESTIVE EVIDENCE, TYPICALLY FROM OBSERVATIONAL STUDIES AND SOME CLINICAL TRIALS; AND ++, PERSUASIVE EVIDENCE, TYPICALLY FROM CLINICAL TRIALS. SOURCE: SCIENTIFIC STATEMENT FROM AMERICAN HEART ASSOCIATION. HYPERTENSION 2006;47:296-308

SIGNIFICANCE TO THE DASH DIET

- Carbohydrates and fiber
- Potassium, magnesium and fiber
- Potassium, magnesium and fiber
- Calcium, protein, potassium and magnesium
- Protein and magnesium
- Magnesium, potassium, protein and fiber

LIFESTYLE MODIFICATION

Prehypertensive patients are at risk for developing clinically significant



hypertension and therefore need effective lifestyle modification to prevent stage I hypertension. Trends of increasing total calories, portion sizes, and refined carbohydrates are compounded by physical inactivity. Elevated sodium content in processed foods and condiments contribute to increase salt intake with the result increased sodium. Studies on dietary modification, specifically the Dietary Approaches to Stop Hypertension (DASH), demonstrated significant BP reduction with reduced salt intake. These effects are amplified by other lifestyle modifications (Table 3). The Treatment of Mild Hypertension Study (TOMHS) confirmed that lifestyle modification is synergistic with antihypertensive therapy to achieve BP reduction and reduce CV risk.

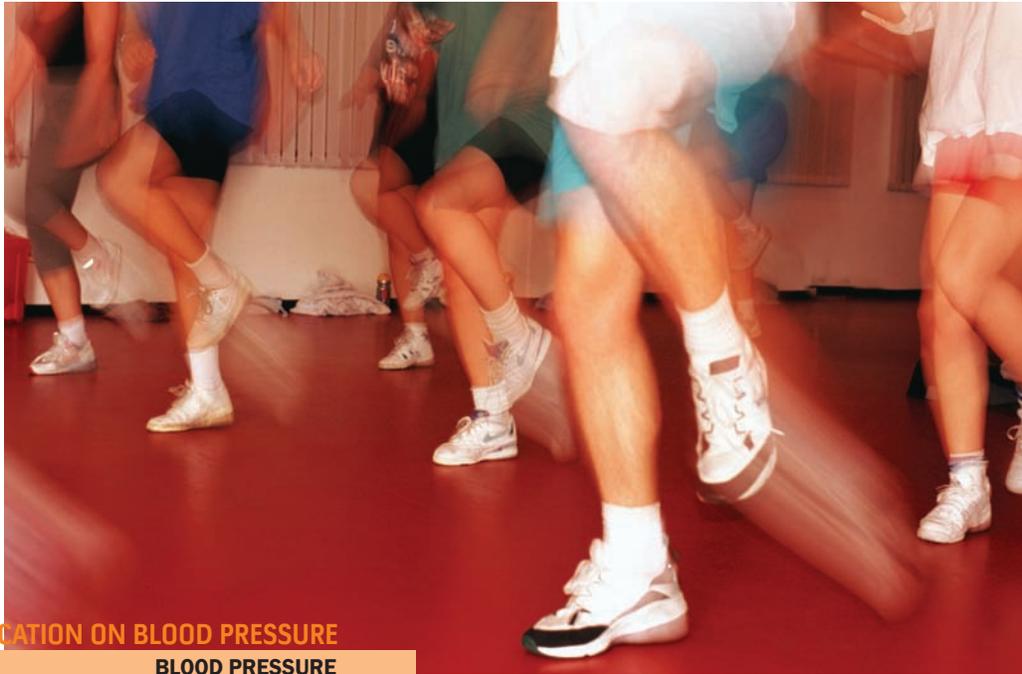


TABLE 3: EFFECTS OF LIFESTYLE MODIFICATION ON BLOOD PRESSURE

TYPE	DESCRIPTION	BLOOD PRESSURE EFFECT
Weight reduction	Target body mass index 18.5 -24.9	5-20 mmHg decrease for every 10 kg of weight loss
Dietary Approaches to Stop Hypertension eating plan	Diet rich in fruits, vegetables, and low fat dairy products, with reduced total and saturated fats	8-14 mmHg reduction
Dietary sodium restriction	Reduce dietary sodium intake to less than 100 mmol/d (2.4 g or 6 g of sodium chloride)	2-8 mmHg reduction
Physical activity	Regular aerobic exercise at least 30 min/d most days of the week	4-9 mmHg reduction
Moderation of alcohol consumption	Limit consumption to no more than two drink equivalents for most men and 1 drink equivalent for women or lighter weight individuals (1 drink = 14 g of ethanol, contained in 12 oz beer, 5 oz wine or 1.5 oz distilled spirits).	2-4 mmHg reduction

ADAPTED FROM JOINT NATIONAL COMMITTEE ON DETECTION, EVALUATION AND TREATMENT OF HIGH BLOOD PRESSURE 7 (JNC-7)

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KNOW YOUR 'OIL' WELL...

Most important and also vulnerable part of our diet is oil/fats. It is useful because it is a source of high calories and harmful if consumed in excess or in limited amount but in imbalanced proportion. This is because not all fats are bad – there are good fats and bad fats. While we need all of them – but in right proportion. The present issue of 'In-Touch' offers a clue on how to choose oil.

In general, fats that are solid in room temperature are bad; those that are liquid at room temperature are good fat. So *ghee* is good fat and margarine is bad fat. Further hydrogenated fats are bad fats and they are used extensively in commercial foods as they are cheaper and have long shelf life. So one should avoid such trans fats.

Finally consumption of oil should not exceed half a kilogram per person per month. ■