

# Healthy Food Habits: Ways and means of limiting the Trans Fat intake

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Presently, India is facing the dual burden of disease – while large majority of the people are suffering from chronic energy deficiency (due to poor quantity and quality of food intake); a sizeable population on the other hand is also suffering from the diet-related chronic degenerative/lifestyle related diseases. The risk factors associated with these diseases include unhealthy dietary practices, physical inactivity, overweight/obesity, smoking/drinking, drug abuse and psychological stress. Among the diet related factors, apart from the total energy intake, quantity and quality of the dietary fat play an important role.

The dietary fats may contain saturated, monounsaturated and polyunsaturated fatty acids. Further, the unsaturated fatty acids can exist either in the *cis* or the *trans* configuration depending on position of the hydrogen atoms at the double bonds. In the case of *cis* configuration, both the hydrogen atoms are on same side of the carbon chain, resulting in a kinked geometry which imparts greater fluidity to the oils. However, in *trans* configuration, the hydrogen atoms are on the opposite side, as a result the chain gets straighter with greater rigidity (Figure 1). Conversion of *cis* isomers to the corresponding *trans* isomers result in an increase in the melting point. From the health view point, lower the melting point, better is the oil or the fat.



**Figure 1: Structural differences in the *cis* and *trans* isomers of fatty acids**

Elaidic acid (9 *trans* C<sub>18:1</sub>) is the geometric isomer of oleic acid (9 *cis* C<sub>18:1</sub>). While, oleic acid has a melting point of 16.3°C, the melting point of elaidic acid (9 *trans* C<sub>18:1</sub>) is 43.7°C and that of vaccenic acid (11 *trans* C<sub>18:1</sub>) 44°C. The *trans* fats are even more harmful than their saturated counterparts.

*Trans* fats or *Trans* fatty acids (TFAs) are the most harmful type of fats which can pose many adverse effects on our body. Major TFAs include elaidic acid (9 *trans* C<sub>18:1</sub>) primarily found in partially hydrogenated vegetable oils, and vaccenic acid (11 *trans* C<sub>18:1</sub>), found in meat/ dairy products. TFAs are also present as conjugated linoleic acid (CLA, C<sub>18:2</sub>). However, in case of polyunsaturated fatty acids (containing  $\geq 2$  double bonds), either one or more of the double bonds can be in *trans* configuration. Thus, it is possible that in the polyunsaturated fatty acids, there is coexistence of the *cis* and the *trans* double bonds.

The commonly consumed vegetable oils like soybean, sunflower, safflower, mustard, olive, rice bran, sesame are the sources of *cis* mono and polyunsaturated fatty acids and their saturated fatty acid content is also low. However, to obtain textural similarity to pure ghee and to improve their oxidative stability, these vegetable oils are subjected to hydrogenation. Since, complete hydrogenation would result in a waxy and excessively hard product; these oils are subjected to partial hydrogenation. Partially hydrogenated oils have a longer shelf life and are less liable to rancidity. However, this process converts some of the *cis*-isomers into their *trans* counterparts and thus leads to the production of *trans* fatty acid. Deodorization of fats/oils (usually carried out at high temperatures; 180°C to 270°C) also results in the formation of *trans* fatty acids.

Partially hydrogenated vegetable oils (PHVOs) have been a significant part of the human diet since ages. Many studies have reported the deleterious effects of *trans* fats derived from PHVO; and this hard fact has been of great relevance in formulating the health guidelines.

Indian consumer today is incognizant of the amount of TFA present in the commercially prepared fried food items and lacks understanding regarding the actual amount of TFA they are consuming during the day through these fried foods. The population in general is ignorant of the adverse effects of TFAs on health.

Food Safety and Standards Authority of India (2010) has recommended that the TFA level in PHVOs should be below 10% which needs to be brought down to 5% in 3 years. Further, it has been proposed to mandate trans fat labelling so as to reduce its intake.

Partially hydrogenated vegetable oils are the major source of trans fats in our diets. A small amount of TFA though present in dairy fat and meat products is not that harmful.

Frying process is another which leads to the production of trans fatty acids; and their formation has been closely associated with the temperature of frying the food, duration of frying, number of times the fats/oils are heated/reheated.

In 2003, World Health Organization had recommended the trans-fat intake (from industrially produced hydrogenated oils and fats) should be less than 1% of the total energy. However, the Indian dietary guidelines propose that the trans fat intake should be less than 2% of the total energy.

### **Suitable strategies to limit the Trans Fat intake include:**

- Avoid using “*Vanaspati/ Partially hydrogenated vegetable oils*” or margarine in your kitchen. Most of our people consider *vanaspati* to be an economical substitute for pure *ghee*.
- Avoid consuming food items prepared in “*Vanaspati/PHVOs*” or margarine; ensure to check the food labels.
- Limit the intake of fried/baked foods, particularly the marketed fried foods.
- Even while frying *Poori/ bhatura* etc. occasionally, use oils (and not the hydrogenated fat) and do not heat the oil for very long time.
- Do not repeatedly heat the oil or re-use the same oil for frying. Generally, masses are not aware of the adverse health effects of TFA and that reheating of fats/ oils results in the formation of TFA.
- Further, after the frying process, cool the left-over fats/oils, strain out the suspended food particles and store the fat/oil in refrigerator/cool place and use it in the preparation of dry vegetables/curries and *pulav* etc.
- Avoid using ready to use/instant mixes for preparing foods as they have a greater chance of containing the Trans fats.
- Check the Nutrition Facts label on packaged food items for their TFA content, if indicated.
- Always check the ingredient list on packaged foods for the words like “shortening”, “partially hydrogenated vegetable oil” or “hydrogenated vegetable oil”, since, these contain trans fats.
- Avoid processed foods like cookies, chips, cakes and patties. Also, avoid consuming commercial fried foods and *mithais* esp if prepared in *Vanaspati/PHVOs*; and limit their quantity as well as frequency of intake.
- While eating out/ ordering food from outside, try to find out the oil being used in food preparation. If possible, request for reducing the amount of oil in the food preparation. A better option is to skip the deep-fried foods while eating out.
- For bakery items like biscuits and cake, red palm oil having a semi-solid texture can be blended with other edible oils, in 1:1/ 1:2 blends and used. It will also enhance the Beta-carotene/vitamin A content of the food item. Due to the semi-solid texture, RPO will help in bringing about the shortening effect in baked items without adding to their TFA content.

**Implications for policy, practice and education:** The authorities need to check the use of *vanaspati* and margarine as well as control an excessive use of the reheated fats/ oils. The *halwais* should be

advised not to use oils over and over again for frying but to consume the used oils in the preparation of vegetables, curries, dough making, *pulav* etc. Nutrition education needs to be imparted to the *halwais* regarding TFA and their adverse health effects as well as they should be trained on correct frying practices.

The government should consider specifying achievable lower limits for TFA and SFA content of vegetable oils and the processed/fried foods. Nutrition labels on processed foods should indicate the TFA and SFA contents separately along with the optimal recommended ranges. The restaurants should avoid the use of 'partially hydrogenated oils' and if otherwise, its use should be disclosed.

Further, the consumers should be made aware of the health hazards associated with TFA intake. In oil processing, the food industry should implement newer technologies so as to produce zero trans fat containing products with desired functional properties. A multi-sectoral and proactive approach is required to successfully remove/reduce industrially produced TFAs from the food supply chain. Targeted message campaigns discouraging the intake of trans-fats containing foods can be of great help.

While some developing countries have laid down norms for TFA content of food, India needs strict regulations regarding the TFA content of fats/ oils as well as that of the commercially prepared food items. Therefore, at present the responsibility lies with the consumers to safeguard their interest. Therefore, steps need to be taken for curbing the trans fat intake through foods prepared both at industrial as well as household level.

“Beware of the trans fats in your diet, their high intake increases the risk of degenerative/lifestyle diseases. Say no to the hydrogenated fats/oils and the products prepared in hydrogenated fats/oils. Further, reduce the intake/frequency of fried foods, particularly the commercially prepared ones”.

(Source: PIB)