

EFFECT OF REFINED SOYABEAN OIL ON HUMAN HEALTH

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1.ABSTRACT

Because of its good agronomic properties and high quality edible oil output, soyabean oil is one of the most important food crops in the world. Oil makes up roughly 20% of commercial soyabeans, with the rest made up of protein, moisture, fat, fiber, and carbs. Soybean oil has 7% triglycerides, 15% linoleic acid, 10% saturated fatty acid, 4% stearic acid, and 10% palmitic acid, with 15% linoleic acid, 10% saturated fatty acid, 4% stearic acid, and 10% palmitic acid. The consumption of a large volume of refined soyabean oil can have a negative impact on human health. Inflammation, mineral insufficiency, and liver disorders are all effects of soyabean oil on human health. Users of soyabean oil had increased insulin resistance, greater fat, and blood sugar levels, all of which are diabetes risk factors. The purpose of this study is to show how refined soyabean oil affects human health.

2.INTRODUCTION

Soybean (*Glycine max L. Merr.*) is the fourth most important crop in the world in terms of area harvested and production Soybean is the most important oilseed and one of the most important and least expensive protein sources produced worldwide. Vegetable soybean also known as soya or soja bean, and formerly known as *Glycine soja*, is a leguminous plant that originated in South eastern Asia (Japan, Korea, and China) and was domesticated 3.000 years ago for its young pods and edible seeds.

Soybean oil, a vegetable oil derived from soybean seeds, is one of the most often consumed oils in the United States, appearing in fast food, packaged goods, and livestock feed. Researchers from the University of California (UC) Riverside found a relation between soybean oil and genetic changes in the brains of mice in a recent study. In recent years, nutritionists and academics have looked into the effects of various high-fat oils on human health, particularly heart health and obesity. Saturated, monounsaturated, and polyunsaturated fatty acids are present in all oils, including peanut, soybean, sesame, olive, avocado, and canola oil ([Lecia Bushak 2020](#)).

On a dry basis, soya bean protein concentrates are more refined than flour and cornmeal and contain at least 70% protein ([Saha and Mandal 2019](#)). Soya beans contain about 40% protein, 20% lipids, 17% cellulose and hemicellulose, 7% sugars, 5% crude fibers, and about 6% ash. Linoleic acid, an essential polysaturated fatty acid, is abundant in soy bean oil ([Pratap et al.2016](#)). The researchers looked at the functional properties of soyabean seeds and products in terms of isoflavone content and antioxidant activity. Isoflavones protect

against a variety of diseases, including bone health, cardiovascular disease, menopause, diabetes, and obesity (Kushwaha et al.2014).

Folic acid has been shown to minimize neonatal mortality due to neural tube defects. Their analysis offers a quantitative estimation of the effects of folic acid supplementation and fortification on the risk of neonatal mortality (Barua et al. 2014).

Soybean seeds are produced at various no linolice acid des along the stem and are affected by their location (Bennett et al. 2003). Oil content and fatty acid composition differ depending on where you are on the axis (Guleria et al. 2008).

The most significant source of fat in the human diet is vegetable oils. Oils are collected and refined from a variety of vegetable sources for a variety of food applications. Product evaluation requirements are critical for both consumers and suppliers in the challenging and competitive edible fats and oils industry. Soybean oil is very common because of its high Omega 3 and Omega 6 content. These fatty acids help to control lipid and cholesterol metabolism as well as prevent artery vein narrowing. Furthermore, its high vitamin B content facilitates digestion and thus avoids chronic digestion problems and constipation. Refined soybean oil is commonly used all over the world for these purposes (H. Yesim Karasulu et al.).

Seed protein, oil, fatty acid, and mineral content are also used to assess the quality of soybean seeds. As a result, improving the quality of soybean seeds is critical to improving human and animal nutrition. (N. Bellaloui et al., 2010). Since prehistoric times, humans have consumed oils and fats in their diet and used them for a number of other purposes. Soybean, a low-oil-content annual oil seed crop, continues to account for the majority of global vegetable oil production (H. Ezzatpanah et al.).

For several years, the soya bean has been grown as a staple food; soya beans contain a protein-rich bean curd that is used in a variety of foods. The oil is used to make margarine and spread because it is high in polyunsaturates and low in saturates. However, there are concerns about the long-term viability of soybean oil production because the process has a negative effect on the climate. These fluctuations in oil and protein availability are due to variations in the supply of specific nutrients and assimilates, as well as other related factors, which are possibly affecting seed germination (Sharma et al. 2009).

3.SOYA BEAN REFINED OIL

Refined soya bean oil is a polyunsaturated fatty acid-rich natural refined vegetable oil. In refined soya bean oil, Soybean oil is high in unsaturated acids that are essential in human nutrition, such as -linolenic acid (omega-3 acid), linoleic, -linolenic, and arachidonic acid (omega-6 acid), and oleic acid (omega-9 acid) the main unsaturated fatty acids are:

a) **Triglycerides**

Soybean oil has five triglycerides that make up more than 70% of the total. LLL, LLO, LLP, LOO, and LOP, as well as their isomers (where L=linoleic, O=oleic, and P=palmitic) are among them. Trans acid triglyceride creation results in functionality at lower pressures. The linoleate-containing triglycerides were reduced at a

significantly faster rate than the linolenate-containing triglycerides, according to high-performance liquid chromatographic analysis of samples taken during a typical hydrogenation run in which the iodine value (IV) was decreased from 130 to roughly 70. (G.R. et al., 2000)

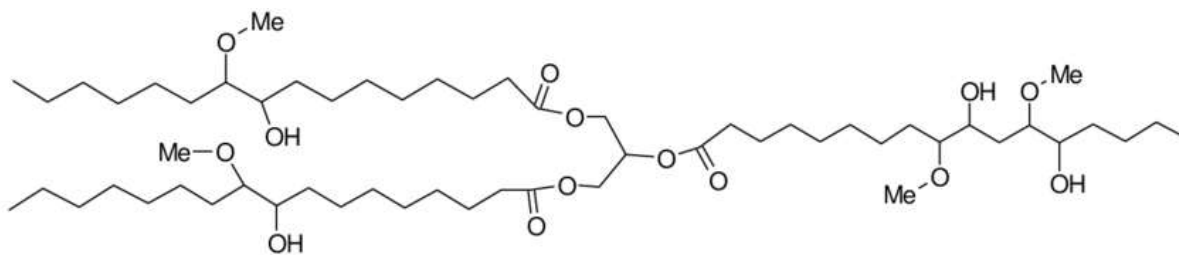


Figure 1: Triglycerides acid

b) Linoleic acid

Linoleic acid (LA, 18:2n-6) is an important n-6 polyunsaturated fatty acid (PUFA)1 that accounts for 1 to 2% of daily energy and is required for optimal growth and development. Prior to the 1930s, LA consumption varied from 1 to 2% of daily calories, but it now accounts for more over 7% of daily calories. 4 Soybean oil provides the majority of LA in the US diet, according to economic disappearance data (Blasbalg et al., 2011).

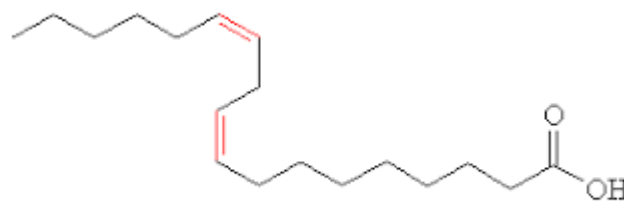


Figure 2: Linoleic acid

c) Saturated fatty acids 10%

Saturated fats elevate blood cholesterol levels, putting you at risk for heart disease. Saturated fatty acid (SFA) consumption has long been linked to a higher risk of cardiovascular disease. Saturated fatty acid (SFA) consumption has long been linked to a higher risk of cardiovascular disease. A switch to a vegetarian diet, or at the very least a major reduction in saturated fat intake, is worthwhile. An elimination diet may be beneficial to some patients.

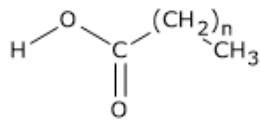


Figure 3: Saturated fatty acid

d) Stearic acid (4%)

At least about 4%, preferably at least about 6%, solids content at 8° F. and at least about 1% solids content at 92° F. are disclosed in fat products comprising high stearic acid soybean oil combined with other processed or unprocessed oils or fats. A basic blend of high stearic soybean oil with processed or unprocessed fats, an interesterified blend, or a combination of these could be used. No hydrogenated fat is found in preferred items.

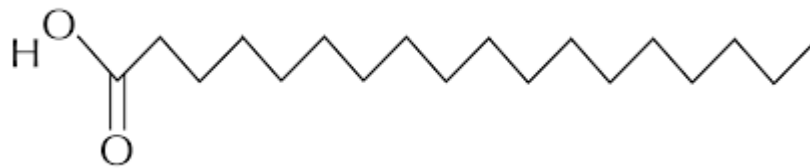


Figure 4: Stearic acid

e) Palmitic acid (10%).

Excessive consumption of palmitic acid, as well as an imbalance of fats in one's diet (too much PA relative to monounsaturated fats and PUFAs like omega-3s and omega-6s), can have negative health consequences. Palmitic acid content in soybeans has been found to be quite variable, ranging from 4% to more than 40% of total seed oil. Palmitic acid levels have been linked to a number of genes and genetic alterations, and at least five separate loci have been identified.



Figure 5: Palmitic acid

Soya bean oil that has been processed can be applied directly to the skin and hair. It can also be quickly added to skin and hair care products as an active ingredient or as a carrier. The suggested dose ranges from 3% to 10%.

It can also be used as a massage oil on its own. Soya bean oil that has been refined has a very low color level and is almost odor less. With its high nourishing properties, the oil is easy to spread, penetrates deeply, and retains a large amount of moisture. Soya bean refined oil is a versatile ingredient that can be used in a variety of cosmetics, from rinse-off to leave-on.

4.NUTRITIVE VALUE OF REFINED SOYA BEAN OIL

Soya bean is a singular food because of its rich nutrient content. Soya bean contains vegetable protein, oligosaccharides, dietary fiber, phytochemicals (especially isoflavones), carbohydrates, fat and minerals (Aparicio et al. 2008).

| NUTRITUION FACTS | PER 100 GRAM |
|------------------|--------------|
| CALORIES | 120,2 |
| MOISTURE CONTENT | 86 |
| PROTEIN | 36g |
| FAT | 6.8 |
| VITAMIN E | 11-15 |
| CARBOHYDRATES | 11 |
| SUGAR | 7.3g |
| FIBER | 4.2 |
| Unsaturated | 15.65 |
| Monounsaturated | 22.78 |
| Polyunsaturated | 57.74 |
| Omega-3 | 52-55 |
| Omega-6 | 6-7 |

PROTEIN

The soya bean is a high-protein food. It has an average protein content of 20-25 percent. Soya bean protein is low in sulphur amino acids, with methionine being the most notable. Some natural components in soyabean, such as trypsin inhibitors, fenolics, and phytic acid, minimize the content of the protein.

FAT

Soybeans are oilseeds that are used to produce soybean oil. Around 18% of the dry weight is made up of fat, predominantly polyunsaturated and monounsaturated fatty acids with a slight amount of saturated fat. Linoleic acid is the most common form of fat in soybeans, accounting for about half of the total fat content.

CARBOHYDRATES

Since whole soybeans are low in carbohydrates, they have a low glycemic index (GI), which is a calculation of how foods impact the increase in blood sugar after a meal. Soybeans are ideal for diabetics due to their low GI.

FIBER

Soybeans have a strong mix of soluble and insoluble fiber. Insensitive people may experience flatulence and diarrhea from the insoluble fibers, which are mostly alpha-galactosides. Irritable bowel syndrome symptoms can be worsened by this (IBS). Soluble fibers in soybeans are usually considered safe, despite the fact that they can cause adverse side effects in some individuals. Short-chain fatty acids (SCFAs) are formed when bacteria in your colon ferment them, which can enhance gut health and lower your risk of colon cancer.

5. PHYSICO-CHEMICAL PROPERTIES OF REFINED SOYA BEAN OIL

| S.NO | Parameter | Refined soya bean oil |
|------|---|-----------------------|
| 1 | Specific gravity | 0.9167-0.004 |
| 2 | Refractive Index (RI) | 1.4685-0.0021 |
| 3 | Flow Time (Sec.) | 6.250-0.042 |
| 4 | Colour | 1.3/18 |
| 5 | Acid value (A.V) (mg KOH / g oil) | 0.145-0.007 |
| 6 | Peroxide value (P. V) (meq O ₂ / kg oil) | 4.75-0.26 |
| 7 | Saponification value (mg /g oil) | 171.11-0.72 |
| 8 | Ester value (mg / g oil) | 170.97-0.73 |
| 9 | Iodine value (IV) (g I ₂ / 100 g of oil) | 117.01-0.311 |
| 10 | Unsaponifiable matter (%) | 0.43-0.002 |

6. PHYSICAL AND CHEMICAL ANALYSIS OF REFINED SOYA BEAN OIL

Crude vegetable oils should be refined to enhance their taste, appearance, and oxidative stability. During this process, color, free fatty acids, oxidation products (peroxides, aldehydes, and ketones), essential fatty acid conversion to trans isomers, and the loss of tocopherols and sterols should all be monitored. The official methods for physical-chemical analysis of oils and fats were published by the American Oil Chemists' Society in 2009 under the title "Official Methods and Suggested Practices." This manual includes the following approaches:

Humidity

Moisture in oil samples implies that they were improperly processed (washing during neutralization) or that the oil containers were contaminated. Moisture is determined in a vacuum oven by estimating the moisture and volatile material by weight difference.

Oxidative stability

The Rancimat method (AOCS, Cd 12 b-92) has been used successfully to measure the oxidative stability index (OSI) of oils with synthetic and natural antioxidants. The method measures the increases of the electric conductivity that arises when fats and oils are oxidized to short free fatty acids (chiefly formic acid) under accelerated conditions of heat and aeration (Kolb et al. 2002; Anwar et al. 2003). OSI values of 5.24 (Anwar et al. 2003), 6.63 (Gómez-Meza et al., 2009) and 7 h (Frank et al. 1982; Judde et al. 2003) for soybean oil without antioxidant at 110°C have been reported. Lopez-Aguilar et al., (2006) found that differences in p-anisidine value and Rancimat were correlated to the difference in rancidity of soybean oils

7.CHEMICAL REFINING OF SOYA BEAN OIL

The aim of soybean oil refining is to transform a crude oil that is unfit for human consumption into a safe and nutritious food. Many undesirable components are found in crude oil extracted from seeds by mechanical pressing or solvent extraction. Any of these impurities, such as free fatty acids (FFA), phospholipids, pigments, and other minor impurities, are removed during the refining phase. After processing, a pure oil is obtained with desirable consumer properties such as odor, taste, light color, and stability. The word "refining" may refer to a variety of different processing steps. The refining method includes steps such as degumming, neutralization, bleaching, and deodorizing.

i. Degumming

A 5-liter, three-necked, round-bottomed flask with a thermometer and a stirring shaft with a Teflon blade operated by a 5000rpm stirring motor was filled with around 1 gallon of crude oil. The stirring motor was started after the contents were purged with nitrogen, and the oil temperature was brought to 60 C. Phosphoric acid (4) or water were used as degumming agents, with concentrations of 0.2 percent and 2% by weight, respectively. Gums were separated by centrifugation and decantation after being stirred for 15 minutes at 60 degrees Celsius.

ii. Neutralization

At 85-90°C, make a NaOH solution. The samples were washed with distilled water and then dried in an oven at 100°C to remove any remaining soaps (Farhoosh et al., 2009).

iii. Bleaching

The oil was brought to 90 degrees Celsius under vacuum for bleaching and final drying. After breaking the vacuum with nitrogen, 0.5 percent super control bleaching earth was applied by weight, the vacuum was

redrawn, and the temperature was raised to 105 degrees Celsius. The oil was cooled to 60 C and filtered under vacuum via a bed of Celite filter aid after being kept at this temperature for 15 minutes with magnetic.

Bleaching is a relatively important method that uses bleaching clays or charcoal to extract several minor impurities from neutralized oils, such as color compounds, oxidation products (peroxides), trace metals, phospholipid residues, and soaps, thus enhancing the oil's oxidative stability and sensory qualities (Garcia Moreno et al. 2013). The available bleaching techniques all use the same adsorption method, and new methods are in high demand (Su et al. 2013) stirring.

iv. Deodorization

Oils were steam processed in a four-unit deodorizer after being degummed, 2X cleaned, and bleached. Steam processing took place at 260 C for 1 hour under a vacuum of less than 1 mm Hg. Under the same conditions, caustic-refined oils were deodorized. On the cooling side of deodorization, all oils were treated with 0.01 percent citric acid.

This is the final stage of edible oil processing, where odour-causing components and trace elements are removed, increasing the oil's shelf life. This stage yields a high-quality refined oil with a light colour and no odor. The odorous compounds in oil are usually waste products from the breakdown of lipids, proteins, and amino acids (Chandrasekar et al. 2014).

8. PHYSICAL REFINING OF SOYABEAN OIL

Physical refining is another way to extract FFA from vegetable oil. This is not a new technique; it was first used in the 1930s to process oils with low gums (coconut oil, palm oil, and animal fats) but high FFA content (> 1%). Physical refining may provide major benefits to refiners, such as the use of less additives, decreased storage of by-products (soaps, and acidified washed waters), and limited loss of neutral oil. Physical refining of oils like canola, sunflower, and particularly soybean oils is becoming more common (Zehnder, 1992).

Physical refining, on the other hand, is only suitable for high-quality crude oils in this situation (low level of oxidation and low phosphatides content after degumming). Chemically refined oils require less steam, a shorter residence time, a higher pressure, and a lower temperature than physically refined oils (Kellens & De Greyt, 2000).

9. CHEMISTRY OF SOYABEAN REFINED OIL

Vegetable oils are soluble in organic solvents such as hexane, chloroform, and petroleum ether but not in water. Triglycerides, which are made up of three monocarboxylic fatty acids esterified to a glycerol molecule, make up the bulk of them. These fatty acids are saturated and unsaturated and have an equal number of carbon atoms (C14-C22).

Fatty acid

Palmitic acid (C16) and stearic acid (C18) are the most frequent saturated fatty acids, whereas oleic acid (C18:1) is the most frequent monounsaturated, and linoleic acid (C18:2) and -linolenic acid are the most

frequent polyunsaturated (C18:3). The effect of fatty acids (saturated and unsaturated) on health, finding that there is adequate evidence that lauric acid (C12), myristic acid (C14), and palmitic acid (C16), but not stearic acid, increase serum cholesterol levels (C18). Consumption of mono and polyunsaturated fatty acids (cis) on the other hand, lowers blood cholesterol and low-density lipoprotein (Connor, 2000; Stanley, 2000). The study discovered a strong link between saturated fatty acid consumption and the occurrence of coronary heart disease. The reason that both trans and saturated fatty acids are involved in developing coronary heart disease (Khosla & Hayes, 1996) is that both induce similar effects on plasma proteins, increasing cholesterol-low density lipoprotein (LDL-C) (Hunter, 2006; Mozaffarian, et al., 2006; Chiuve et al., 2009).

Phospholipids

When phospholipids are exposed to air or sunlight, they become exceedingly unstable, and color deepening and oxidative rancidity are common. At high temperatures, phospholipids become unstable. When oil and phospholipids are processed at 150 degrees Celsius, the color of the oil darkens and the stench of the phospholipids worsens. Phospholipids disintegrate at temperatures above 150°C. Phospholipids are considered antioxidant synergists, and they can enhance or prolong tocopherol's antioxidation function. Due to the variances in oil and phospholipids, the synergism of phospholipids vary. The highest antioxidant property is seen in mixtures of PE, mixed tocopherol, and synthetic antioxidant (wu,2001).

Tocopherols

Tocopherols, which come in a variety of forms including α , β , γ , and δ , are the most essential natural antioxidants found in fats and oils (Ball et al., 1978 and Swern et al., 1979). The primary forms in soybean oil are α and δ -tocopherols, which have been found by some researches to have stronger antioxidant activity than the others (Ikeda et al., 1977). Unsaturated oil autoxidation is a free-radical chain reaction. Tocopherols are easily oxidized; α -tocopherol, in instance, is quickly converted to chroman-5,6-quinone, which has poor antioxidant properties (Fourie et al., 1989). The decrease in tocopherol content in oil products is primarily due to oil processing, particularly deodorization. As a result, oil stability suffers (Carpenter et al., 1979). Soybean quality, storage time, content of damaged beans, and storage conditions of refined, bleached, and deodorized (RBD) oils are all factors that affect the tocopherol content of soybean oils. As a result, the goal of this research was to look at the factors that influence the tocopherol content of soybean oils, as well as approaches to improve the quality of RBD soybean oil.

Sterols

Sterols are frequently employed as emulsifiers in the cosmetics sector. Soybean oil provides 75 percent of the world's sterols now on the market. These sterols come from the deodorized distillation products of soybean oil and other vegetable oils (Clark, 1996). Consumption of sterols has been shown to be beneficial to human health. Sterols have been proven in recent research to aid in the decrease of LDL cholesterol in human serum. This drop is due to a decrease in cholesterol absorption and an increase in bile acid excretion in the small intestine (Normén et al., 2000; Vissers et al., 2000; Sanclemente et al., 2009).

10. PHYSICAL CHARACTERISTICS OF SOYABEAN OIL

By weight, dry soybean seeds contain roughly 18-20% extractable oil. The seeds are pressed for oil, and the leftover soybean powder is utilized as cattle/animal feed. Soybean oil is a dark yellow liquid that contains contaminants such as moisture, lecithin, free fatty acids, and volatile substances. Further refining removes these contaminants, resulting in a cooking oil of acceptable quality. Oil that has been refined is a transparent light yellow liquid with a neutral odor and flavor. Free fatty acids (FFA) in fresh oil are very low, less than 0.1 percent.

11. EFFECT OF SOYA BEAN REFINED OIL IN HUMAN HEALTH

Constipation, bloating, and nausea are some of the moderate stomach and intestinal side effects of soy. In certain people, it can also cause allergic reactions such as rash, scratching, and anaphylaxis. It's possible that some people would feel tired. Thyroid function can also be impaired by soy. This, however, tends to be more common in people who are iodine deficient. Long-term use of high doses of soy extract supplements may be dangerous. There is some concern that this could lead to excessive uterine tissue growth

When used in medicinal quantities during pregnancy, soy may be dangerous. Higher doses during pregnancy could damage the baby's development. The protection of higher doses during breast-feeding is not well understood. To be on the safe side, stay away from higher doses. Phytoestrogens in high concentrations can be harmful. People with kidney failure who consume soy products can experience an increase in phytoestrogen levels in their blood. Kidney stones are caused by excessive quantities of a group of chemicals known as oxalates. Soy lecithin is made from processed soybean oil, which is thought to eliminate the majority, if not all, of the soy protein that a soy allergy sufferer would like to avoid. When soybeans are used, certain interactions and side effects are observed. Take, for example, the drug Warafarin, which is widely used to avoid blood clotting. Consumption of soy raises the risk of blood clotting. There is also a link between antioxidants and Tamoxifen use. (Neela Bolla 2015).

It can induce persistent inflammation:

For years, the popular additive and cooking oil was thought to be a healthier alternative to health-damaging saturated fats, but recent research reveals that soybean oil may be just as hazardous when it comes to weight growth. Our bodies developed with a nearly equal balance of omega-6 and omega-3 fatty acids; unfortunately, our diets have changed fully to omega-6s during the last century. According to a study published in *Nutrients*, most Americans consume 20 times more omega-6s than they require, which is a major issue given that omega-6s cause inflammation, fat storage, and weight gain, whereas omega-3s are anti-inflammatory. One of the most important reasons for this shift? High consumption of foods cooked in soybean oil, which has a 7.5:1 ratio of omega-6 to omega-3 fatty acids. (For comparison, a neutral oil substitute such as canola oil has a 2.2:1 ratio.)

It can irritate your throat :

That is, unless you are allergic to birch pollen. Oral allergy syndrome (OAS) arises when your immune system misidentifies proteins in some raw foods as allergenic proteins found in pollen, confounding your immune system and exacerbating allergy symptoms. According to a Japanese study, nearly 10% of individuals with birch pollen allergies had soy milk sensitivity (reported as a "abdominal burning feeling" and itchy throat). Despite the fact that soy milk is processed and was previously thought to be unable to elicit an OAS response, researchers believe the symptoms are attributable to the fact that the proteins in soy milk are not fully broken down during processing, leaving these allergy-inducing chemicals visible in the milk.

It can result in mineral deficiency:

Soybeans are infamous for having a high phytic acid content. Soybeans, in fact, contain more phytate than any other grain or legume that has been investigated. This anti-nutrient binds to minerals like iron, calcium, magnesium, and zinc, preventing them from being absorbed. Zinc deficits are prevalent and have been demonstrated to cause anxious behavior and despair in anxious people. Unfortunately, traditional phytate-reduction techniques such as cooking, soaking, and sprouting (which work for other legumes and whole grains that also have phytates) have been found to be ineffective for soybeans, and the only way to significantly reduce the phytate content of soybeans is through fermentation.

They inhibit the digestion of proteins:

Soy is like that date that expects affection but doesn't want to cuddle or PDA. Even while soy is high in lean protein, it also contains trypsin and protease inhibitors, which make protein digestion extremely difficult, causing gastrointestinal pain as well as a lack of amino acid absorption if consumed in excess. Soaking and heating the beans is the only way to get rid of these anti-nutrients.

Diabetic risks:

Diabetes is caused by chronically elevated blood glucose levels, which are followed by insulin resistance or insulin secretion impairment. Approximately 90% of Type 2 diabetes patients are overweight or obese. As a result, obesity is a significant contributor to the development of Type 2 diabetes. Gaining a lot of weight, for example, is a sure marker of insulin malfunction. When insulin stops working, your blood sugar remains high, increasing your chance of developing a chronic condition. And, as previously stated, high linoleic diets are connected to obesity. Mice were fed soybean oil in one rodent trial, for example. Soybean oil users showed increased insulin resistance, were more fat, and had higher blood sugar levels, all of which are diabetes risk factors.

Liver problems:

NAFLD appears to be exacerbated by soybean oil in particular. According to the findings of the same rodent study, mice on a high soybean oil diet were substantially more susceptible to metabolic illness, particularly fatty liver. Your liver works tirelessly to keep your cholesterol levels in check, clean your blood, help digestion, process nutrients, and so on. However, one of the most common causes of liver dysfunction in the

United States is on the rise. It's termed non-alcoholic fatty liver disease (NAFLD), and it affects 30-40% of people in the United States. Visceral liver fat buildup causes a slew of symptoms and problems, including:

- Fatigue.
- Abdominal pain.
- Abdominal swelling.
- Jaundice

Toxicity of the immune system

Soybean oil has the potential to be harmful to immunological cells. In one study, individuals were given either olive oil or soybean oil for two weeks before lymphocyte and neutrophil levels were assessed. Soybean oil, unlike olive oil, was hazardous to both types of immune cells, which are needed to combat infections and keep you feeling well. "Soybean oil emulsion administered as a single dose of 500 mL enhances lymphocyte and neutrophil mortality, which may increase the susceptibility of the patients to infections," the researchers found.

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12. ANTIOXIDANTS ENZYMES LEVEL

Antioxidants such as butylated hydroxyanisole, tertbutylhydroquinone (TBHQ), and butylated hydroxytoluene (BHT) have been commonly used as food additives to improve the oxidative stability of soybean oil (Eshghi et al. 2014).

Refined soybean oil has been discovered to be one of the most unstable materials, not only because of its high content of unsaturated fatty acids, but also because it lacks natural compounds that can provide a protective antioxidant impact. The types of volatile products, on the other hand, are determined by the triacylglyceride precursors. The decomposition of one of the several hydroperoxides present in oxidized soybean oil is expected to produce a complex mixture of volatile products. The number of flavor and odor compounds found by various authors is steadily growing as analytical methodology improves (Juárez and Meza 2011).

13. CONCLUDING REMARK

The findings of this study could help to enhance public awareness regarding whether soybean refined oil is healthy or not. Because of its high quantity of unsaturated fatty acids and lack of natural compounds, refined soybean oil has been determined to be one of the most unstable materials. Soybean oil has the ability to destroy cells in the immune system. Palm oil is mixed in with refined oil to cut costs, however palm oil contains paraffin, which is a semi-liquid substance. They begin by freezing in our heart's veins and ultimately

choke our arteries and veins. Then we have respiratory problems, and a heart attack occurs. As a result, the processing technology described in this study could be used to treat soybeans at the village level for human consumption. Refined soya bean oil contains isoflavone, polysaccharide, and fatty acids, all of which are harmful to human health.

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