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Flax seeds for human health and their benefits

Arava Vidyadhari^{*1}, Mangala Teja Divya², Bandi Divya Sree², Tummala Pavani², Tatiparthi Siva Prasad², Ashok Kumar V², Porumamilla Ram Prathap Goud²

¹Department of Pharmacology, Saastra College of Pharmaceutical Education & Research, Near Varigonda Jwalamukhi Temple, Muthukur Raod, Kakupalli, Nellore-524 311 Andhra Pradesh, India.

²Saastra College of Pharmaceutical Education & Research, Near Varigonda Jwalamukhi Temple, Muthukur Raod, Kakupalli, Nellore-524 311 Andhra Pradesh, India

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Abstract



Flaxseed (*Linum Usitatissimum* L) is celebrated for its abundance in Omega-3 polyunsaturated fatty acids, particularly alpha-linolenic acid, offering a myriad of health benefits. Through biochemical scrutiny, its bioactive lignans have been singled out as potentially advantageous for human health enhancement. Cultivated globally for its nutritional richness and therapeutic properties, flaxseed is utilized for both its fiber and oil content, correlating with a diminished risk of various conditions like cardiovascular disease, diabetes, cancer, osteoporosis, arthritis, and autoimmune and neurological disorders. Regular consumption has been associated with lowered blood pressure, improved lipid profiles, and enhanced insulin resistance, while its antioxidant properties promote healthier skin, faster wound healing, and alleviate menopausal symptoms such as constipation and mental fatigue. However, alongside its beneficial components, flaxseed contains compounds like phytic acid, cadmium, trypsin inhibitor, and cyclogenic glycosides (CGs), which may impede its health-promoting effects and reduce the absorption of critical nutrients. Available in three primary forms - flaxseed oil, ground flaxseed, and whole flaxseed - integrating it into one's diet could serve as a proactive measure against various health issues, underlining the plant's remarkable versatility and potential in bolstering overall well-being.

*Corresponding Author

Name: A. Vidyadhari
Phone: +91 6302192037
Email: aravavidhyadhari@gmail.com

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INTRODUCTION

One of the oldest crops is flaxseed, which has been grown since the dawn of civilization (Laux 2011). Which translates to "very useful," *Linum usitatissimum*, is the Latin name for flaxseed. Originally brought to the United States by colonists, flax was mostly used to manufacture fibre for clothes. Commercial use is made of every portion of the flaxseed plant, either before or after processing. The stem produces high-quality, durable, and strong fibre [1].

Although flaxseed and its byproducts are used in the composition of animal feed, flaxseed was primarily employed until the 1990s for the production of cloth as well as paper. Due to the possible health benefits linked to certain of its biologically active components, flaxseed has garnered considerable attention in nutrition along with illness studies throughout the past 20 years [2].

Flaxseeds possess nutritional properties and are an abundant supply of acids. Its health benefits—including a lower risk of cardiovascular disease, cancer, especially prostate and mammary gland cancer, anti-inflammatory properties, a laxative impact, and the relief of menopausal symptoms as well as osteoporosis—have contributed to its rising popularity.

When referring to flax consumed by people, the term flaxseed is frequently used. In Indian languages, it is commonly referred to as JAWAS, ASKE BIJA, and ALSO. The blue-flowering annual herb that produces flaxseeds is a member of the Linaceae family [3].



Figure 1: Image of Flax Seeds

Flax plants can reach heights of 12 to 40 inches. The plant features beautiful blue flowers that can reach a diameter of 3 cm, accompanied by a short as well as fibrous stalk. The five-petaled blossoms resemble a five-celled ball with the potential to hold ten seeds. Until the plant's growth stops, flowering continues. There are two seeds in each of the five compartments of the spherical fruit capsules. Tall, unbranched plants that are cultivated at a very high density of maximum fibre are known as fibre flax variations [4].

BENEFITS OF FLAX SEEDS

1. Cancer

According to recent research, flaxseeds may offer some protection against "breast cancer." It appears that at least two of the ingredients in flaxseeds are involved.

In animal research, the plant omega-3-fatty. Flaxseed acids, or ALA, have been shown to decrease the growth as well as occurrence of tumours. The lignans in flaxseed may offer some defence against hormone-sensitive malignancies without conflicting with the "drug" Tamoxifen for breast cancer.

By inhibiting the growth along with the dissemination of tumour cells and blocking enzymes involved in hormone metabolism, lignans may aid in the fight against cancer [5].

2. Cardiovascular disease

According to Fitzpatrick, studies indicate that plant omega-3s support the cardiovascular system via a number of distinct pathways, such as their ability to reduce inflammation as well as to restore a regular heartbeat. More recent findings also point to the potential benefits of flaxseeds for decreasing blood pressure. Flaxseed's lignans have been demonstrated to lower atherosclerotic plaque accumulation by as much as 75%, according to Fitzpatrick.

Plant omega-3s may help cure arrhythmia, or irregular heartbeat, along with heart failure since they may also help preserve the heart's natural rhythm. This requires further investigation [6].

3. Diabetes

Daily use of flaxseed, which contains lignans, may also slightly lower blood sugar levels in persons with type 2 diabetes, as determined by haemoglobin A1c blood tests.

4. The state of inflammation

According to Fitzpatrick, two flaxseed constituents, lignans and ALA, may help prevent the release of some pro-inflammatory chemicals, thereby reducing the inflammation that is associated with certain illnesses like asthma and Parkinson's disease.

Human inflammatory responses have been demonstrated to be reduced by ALA. Furthermore, lignans have been demonstrated to lower levels of a number of pro-inflammatory chemicals in animal tests.

Another method flaxseed may help prevent heart attacks and strokes is by reducing inflammation linked to plaque accumulation in the arteries [7].

5. Hot flashes:

Two tablespoons of ground flaxseed mixed into cereal, juice, or yoghurt twice a day was suggested by a 2007 study on menopausal women. Slash half of their heat flushes. Their hot flashes also became less intense by 57%. After taking the daily flaxseed for just one week, the women saw an improvement, and in two weeks, they reaped the most benefit. However, a different study found that giving postmenopausal women and breast cancer patients a bar containing 410 milligrammes of phytoestrogen from the ground did not significantly reduce the incidence of hot flashes [8].



Figure 2: Benefits of flax seeds

EFFECTS OF FLAX SEEDS

Originating in Southern Europe as well as Asia, flaxseed is a food derived from plants. For millennia, Ayurvedic medicine has also utilised these golden-yellow to reddish-brown seeds. But like anything else, if flaxseed is not taken in moderation, it can also have negative consequences. These comprise haemorrhage disorders, allergic responses, along with many more [9].

Flax seeds can have the following negative effects:

1. May cause allergic reactions:

Your chances of having an allergy to flaxseed and flaxseed oil are high. If you experience itching, swelling, redness, or hives, you should cease eating these seeds. Moreover, nausea and vomiting may be signs of an allergy. People regularly eat flaxseed are more susceptible to allergic responses.

2. Unsafe during nursing and pregnancy:

Flaxseeds may be hazardous to expectant mothers because of their remarkable resemblance to oestrogen. As a result, it is recommended to only eat flaxseeds if your doctor approves [10].

3. Could result in loose stools:

Although flaxseeds are high in dietary fibre, consuming more of them suddenly may result in more bowel motions. Additionally, you can have diarrhoea, constipation, bloating, as well as stomachaches.

4. Causes Intestinal blockage:

Flax seeds are best consumed with water or another drink, but if you eat them on an empty stomach, you run the risk of intestinal blockage and obstructions. Patients suffering from Scleroderma should be very cautious as flaxseeds have the potential to cause severe constipation and obstruction. Thus, unless your physician gives you the all clear, avoid consuming it.

5. Incompatible with other drugs:



Figure 3: Side effects of flax seeds

Flaxseeds contribute to constipation and intestinal obstruction because of their high fibre content. Certain drugs and supplements have trouble being absorbed when someone has this disease. It is advisable to avoid it, particularly if you're taking oral medication to lower your blood sugar levels [11].

NUTRITIONAL VALUES [12]

The USDA has published the following nutritional data for one table spoon (10g) of whole flax seeds.

It contains:

- Calories : 55
- Fat : 4.3g
- Sodium : 3.1mg
- Carbohydrates : 3g
- Fibers : 2.8g

- Sugars : 0.2g
- Protein : 1.9g

CONCLUSION

Flax seed has a nutritional profile that may be suitable for health. Still, a lot of people are ignorant about the food applications and potential health advantages of flaxseeds. The greatest source of lignans and alpha-linolenic acid is flaxseeds.

It is also a significant possible source of high-quality protein and soluble fibre antioxidants. A vast population has benefited from its lengthy journey from use as a medicine in antiquity to its current status as a nutritious food source in the twenty-first century. Pasta and baking supply firms have recently added flaxseed to their recipes. As a result, using ground or whole flaxseed as a dietary supplement is advised.

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Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

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