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Popular Article

Nutritional Composition and Potential Health Benefits of Flaxseeds- A Functional Ingredient

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Flaxseed or Linseed (*Linum usitatissimum*) is popularly known as Alsi in Indian language, belonging to family Lineaceae and mainly considered as oilseed crop. It is a blue flowering annual herb that produces small flat seeds varying from golden yellow to reddish brown color. The ancient Egyptians used flaxseed as both food and medicinal purposes. The Latin name of flaxseed (*Linum usitatissimum*) means “very useful”, and it has two basic varieties: brown and yellow or golden (also known as golden linseeds). Flaxseed possesses crispy texture and nutty taste (Morris, 2007). Flaxseed is a good source of fat, protein and dietary fibre. It is well-known for the content of chemical compounds with specific biological activity and functional properties: polyunsaturated fatty acids (PUFA) omega-3 family, soluble dietary fibres, lignans, proteins and carbohydrates (Rubilar *et al.*, 2010). Flaxseeds can be used as a functional food ingredient because it provides omega-3 fatty acids, digestible proteins, and lignans. In addition to being one of the richest sources of α -linolenic acid oil and lignans, flaxseed is a source of phenolic compounds. The biologically active components in flaxseed help in the prevention of some chronic diseases such as many types of cancer, diabetes,

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cardiovascular diseases and cerebrovascular stroke. Due to its high nutritional value other than its oil content, flaxseed is incorporated into traditional cereal-based matrices as bread and pasta, in egg products, in ready-to-eat snack foods known for their high consumer acceptability. Flaxseed is considered as one of the most important oilseed crops for industrial as well as food, feed, and fibre purposes. (Mercier *et al.*, 2014). Flaxseed is emerging as an important functional food ingredient because of its rich contents of α -linolenic acid (ALA), lignans, and fibre.

Nutritional Composition of Flaxseeds

Among the functional foods, flaxseed has emerged as a potential functional food being good source of alpha-linolenic acid, lignans, high quality protein, soluble fibre and phenolic compounds (Oomah, 2001). Flaxseed is rich in fat, protein and dietary fibre. The composition of flaxseed varied with genetics, growing environment and method of seed processing (Daun *et al.*, 2003). Flaxseeds constitutes about 6.5 g per 100 g moisture, 20.3 g per 100 g protein, 37.1 g per 100 g fat, 4.8 g per 100 g crude fibre, 24.5 g per 100 g total dietary fibre, 2.4 g per 100 g ash content and 28.9 g per 100 g carbohydrates. Flaxseeds exhibits calorific value of 530 kcal per 100 g its edible portion. Regarding mineral composition, flaxseeds comprised of 750 mg per 100 g potassium, 170 mg per 100 g calcium, 370 mg per 100 g phosphorous and 2.7 mg per 100 g iron. Regarding vitamin content, flaxseeds constitute about 30 mg per 100 g vitamin A, 0.6 mg per 100 g vitamin E, 0.23 mg per 100 g thiamine, 0.07 mg per 100 g riboflavin and 1 mg per 100 g niacin. The protein content of flaxseeds decreases as the oil content increases and it is well known that flaxseeds are a source of high content of polyunsaturated fatty acids (Pradhan *et al.*, 2010).

Health benefits of Flaxseeds: Flaxseeds provides various potential health benefits that can support our body against a variety of diseases. Some of the health benefits of flaxseeds are:

- Flaxseed are rich in plant compounds especially lignans that have been studied for their potent cancer-fighting properties.
- Flaxseed's high fibre content may help lower cholesterol levels and improve heart health which may be especially useful for those with high blood pressure.



- Flaxseeds are also associated with a lower risk of breast cancer, particularly in postmenopausal women. Their intake also protect human body against colorectal, skin, blood, and lung cancer.
- Flaxseeds contains two types of fibre -soluble and insoluble fibre which get fermented by the bacteria in our intestines to support gut health and improve bowel regularity.
- The soluble fibre in flaxseeds may stabilize blood sugar levels and promote blood sugar control and also lowers the cholesterol.
- The insoluble fibre in flaxseeds plays an important role in preventing constipation and also promote regular bowel movements.
- Flaxseeds also helps in weight management.
- Flaxseed can interact with several medications, including blood thinners and antiplatelet medications.

Applications of flaxseeds as functional ingredient:

Due to its high nutritional value other than its oil content, flaxseed can be easily used as functional ingredient in the development of various functional food products. It is easily incorporated into traditional cereal-based matrices as bread and pasta, in egg products, in ready-to-eat snack foods known for their high consumer acceptability. Flaxseed is emerging as an important functional food ingredient because of its rich contents of α -linolenic acid (ALA), lignans, and fibre. Some of the applications of flaxseeds as functional ingredient in the development of various foods include:

- Breads and other baked goods such as cookies and muffins including gluten free products. The incorporation into bread results in an improved texture and crumb structure.
- Healthy functional snack foods such as high protein and fibre rich energy bars.
- Flaxseed powder can be easily incorporated in the preparation of smoothies.
- Flaxseed can be incorporated into meat or veggie patties.



Conclusion

Flaxseed (*Linum usitatissimum*) is an oil-based seed that contains high amounts of alpha-linolenic acid, linoleic acid, lignans, fiber and many other bioactive components which is suggested for a healthier life. Flaxseed also satisfied the basic needs in the human diet. Consumption of flaxseeds in different forms has valuable effects and protects against cardiovascular disease, hypertension, diabetes, dyslipidemia, inflammation and some other complications.

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