



Received: 21-10-2024

Accepted: 01-12-2024

## International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

### A Review on Flaxseed as a Hair Smoothing Agent

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#### Abstract

The blue flowering crop flaxseed (*Linum usitatissimum*), which is also known by other Indian names such as linseed, jawa, aksebija, etc., yields tiny, flat seeds that range in color from reddish brown to golden yellow. A natural solution for good hair, flaxseed (*Linum usitatissimum*), which is high in fiber, lignans, and omega-3 fatty acids, has garnered attention. In order to better understand flaxseed's potential as a hair smoothing agent, this review will focus on its moisturizing, strengthening, and nutritional qualities. Flaxseed's biologically active components, especially its

high levels of antioxidants and essential fatty acids, support the plant's ability to hydrate hair, lessen frizz, and improve texture. They also lessen inflammation on the scalp, encourage hair growth, and shield the environment from harm. Despite the encouraging advantages, more clinical studies are required to determine the best formulations and long-term impacts. The review's conclusions highlight flaxseed as a sustainable and natural component for hair care products meant to make hair healthier, smoother, and glossier.

**Keywords:** Flaxseed, Natural Hair Care, Hair Smoothing, Moisturizing, Antioxidants, Hair Growth, Scalp Health

#### Introduction

Flaxseeds, scientifically known as *Linum usitatissimum*, belong to the Linaceae family and are also known as Alsi, Jawa, and Aksebija in Indian languages<sup>[1]</sup>. The color of the seeds varies from golden yellow to reddish brown. It is made from the seeds of *Linum usitatissimum*. It's also known as linseed. Flaxseed is an important functional food element because to its high concentration of Alpha-linolenic acid (ALA), an Omega-3 fatty acid that delivers vitamins, proteins, and nutrients to the hair and scalp. Omega-3 fatty acids aid to reduce hair loss by inhibiting follicle inflammation. It stimulates circulation in the scalp, which encourages hair growth. Alpha-linolenic acid has anti-inflammatory properties and offers sustenance and nutrients to the scalp. The antioxidants produced by flaxseed are lignans. Lignans could help suppress or inhibit bacterial development. Lignans may promote hair regeneration and prevent hair loss. Vitamin E, an antioxidant found in flaxseed, helps to prevent hair loss and nourish the hair. Flaxseed is a regular source of vitamin B complex. Vitamin B complex is a set of nutrients known for growing hair stronger and healthier at a faster rate<sup>[2]</sup>.

#### Flaxseed<sup>[3]</sup>

- **Biological Source:** *Linum usitatissimum* Linn.
- **Family:** Liliaceae.
- **Kingdom:** Plantae (Plants).
- **Subkingdom:** Trophobiont (Vascular Plant).
- **Subdivision:** Spermatophyta (Seed Plant).
- **Division:** Magnoliophyta.
- **Class:** Magnoliopsida (Dicotyledons).
- **Subclass:** Rosidae.

- **Order:** Linales.
- **Genus:** Linum L.
- **Species:** Usitatissimum L.

#### Constituents<sup>[4]</sup>

The flax seeds contain 35-45% oil which contain 9-10% of saturated fatty acids (palmitic and steric) about 20% monosaturated fatty acids (mostly oleic acid), and over 70% alpha-linolenic acid. Flax seeds have between 20 and 30 percent protein. Flax seed is rich in nutrients and offers numerous health and hair benefits because it contains:

- Protein
- Omega-3-Fatty Acid
- Fibers
- Antioxidants
- Vitamin E
- Bioactive Compounds and Ligands
- Vitamin B
- Magnesium
- Manganese
- Selenium.

#### Types

The two main types of flaxseed are: Golden flaxseed and Brown flaxseed

- Golden flaxseed (yellow flaxseed)



**Fig 1:** Golden flaxseed



**Fig 2:** Brown flaxseed

**Appearance:** Golden flaxseeds have a pale yellow to golden color. Their exterior is bright and smooth.

**Taste:** Compared to brown flaxseeds, golden flaxseeds have a softer, slightly sweeter, and more delicate flavor.

**Nutritional Profile:** Omega-3 fatty acids (ALA), dietary fiber, and lignans (antioxidants) are rich in golden flaxseeds. Although their nutritional profile is similar to that of brown flaxseeds, they occasionally have a slightly higher omega-3 level.

- Brown flaxseed

**Appearance:** Usually reddish-brown to dark brown, brown flaxseeds have a deeper tone.

**Taste:** Compared to the lighter golden variety, brown flaxseeds have a stronger, earthier flavor. Because of this, they can be used in recipes that call for a stronger flavor.

**Nutritional Profile:** Omega-3 fatty acids, fiber, and lignans are also rich in brown flaxseeds. Both brown and golden flaxseeds are great providers of fiber, protein, and healthy fats, and there is not much of a nutritional difference between them.

#### Comparison of Brown and Yellow Flaxseed

Based on Table 1, the nutritional composition of brown and yellow (Omega) flax types is nearly the same. There aren't many nutritional distinctions between them, most likely because to different growing environments. The amount of pigment present determines the color of the seed coat, as was previously mentioned. Regular plant breeding procedures can alter this characteristic<sup>[19]</sup>.

**Table 1:** List of main constituents is listed in enclosed table<sup>[5, 10]</sup>

Constituents (in g/100g)	Brown flax	Yellow flax
Alpha-linolenic acid	58.2	50.9
Linoleic acid	14.6	15.9
Proteins	22.3	29.2
Saturated fatty acids	8.7	9.0
Oil/fats Specific fatty acids	44.4	43.6
Monosaturated fatty acids	18.0	23.5

#### Hair smoothening agent

A hair smoothening agent is a chemical or product that softens and smoothes hair, minimizing frizz, curl, and abnormalities in texture. To make the hair look smoother, shinier, and easier to manage, these agents usually coat the hair strands, fill up cuticle gaps, or change the natural structure of the hair. They could include keratin, silicones, amino acids, or other conditioning agents that serve to smooth and soften hair so that styling is simpler<sup>[23]</sup>.

Flaxseed's strong nutritional profile and capacity to enhance hair texture have led to its growing recognition as a natural and efficient hair smoothening product. Omega-3 fatty acids, antioxidants, and mucilage—a gel-like substance—are among the healthy substances found in flaxseed that combine to hydrate, nourish, and smooth hair. Flaxseed smoothes hair in the following ways:

#### Mechanisms

- **Omega-3 fatty acids:** Omega-3 fatty acids, which are present in flaxseeds, are good for the health of the scalp and the strength of hair. Healthy hair growth results from omega-3 fatty acids' ability to nourish the scalp, lower inflammation, and increase circulation. Additionally, they aid in retaining moisture in the hair shaft, which leaves the hair feeling softer, smoother, and more hydrated.

- **Mucilage and Hydration:** When flaxseed is combined with water, mucilage, a gel-like material, is created. This mucilage helps to smooth the cuticle, the outermost layer of hair, by coating the hair strands when applied. This smoothing effect makes the hair look sleek and polished while reducing frizz. The mucilage also gives the hair moisture, which keeps it from drying out and breaking, giving it a smoother texture<sup>[24]</sup>.
- **Antioxidant:** Antioxidants included in flaxseeds, like lignans, can shield hair from environmental harm like pollution and UV rays. Because of this protection, the hair looks smoother and more glossy by avoiding drying out or getting damaged<sup>[20]</sup>.

Protein and Amino acids: A good source of protein, which is necessary for the health and structure of hair, is flaxseeds. Flaxseed's proteins and amino acids strengthen the hair from the inside out, nourish it, and aid in the healing of damaged hair. This may result in less porous, smoother hair that is more resilient to breakage and frizz.

#### Application of Flaxseed for Hair Smoothing

- **Flaxseed Gel:** Making flaxseed gel is the most popular method for maintaining silky hair. The mucilage is extracted from flaxseeds by heating them in water to create the gel. This gel can be used as a style gel to enhance shine and smooth frizzy hair or as a leave-in conditioner once it has cooled.
- Flaxseed gel to help promote hair development and fortify existing hair, flax seed gel can be applied as a moisturizer to the scalp and hair. Topical formulations include liquids, pastes, gels, ointments, oils, and creams. Since gels are more stable and may offer regulated release compared to other semisolid preparations, they are currently gaining popularity. Because gel formulations enhance absorption qualities, they can increase drug bioavailability. No matter the type of hair or curls, Pure Flaxseed Hair Gel will give your hair a "wet curly look" while it's dry and elongate and define them. This natural flaxseed gel is lightweight and ideal for wavy, greasy, and curly hair. Flaxseeds and castor oil, which are natural sources of vitamin E, are added to it. A natural solution for hair regrowth, flaxseed keeps your hair healthy, lustrous, and free of frizz, crunch, and flakes<sup>[21]</sup>.
- **Flaxseed in Hair Masks:** Combining flax seeds with additional natural ingredients like honey, aloe vera or coconut oil can result in a hair mask that is both hydrating and smoothing. To maintain soft, hydrated hair, this can be applied once a week<sup>[22]</sup>.
- **Flaxseed Oil:** Applying and massaging flaxseed oil into the scalp and hair produces deep moisture and nourishment, which is why it is used to soften hair. Additionally, it can keep hair hydrated and manageable by preventing dryness and retaining moisture. Flaxseed oil, sometimes referred to as linseed oil or flax oil, is made from flax seeds that have been crushed and compressed to release their natural oil. One Life Flaxseed Oil has a lot of omega-3 fatty acids. It contributes to the enhancement of overall health. Flaxseed is a nutrient that reduces inflammation. Flax seed oil provides limp, lifeless hair volume, calms sensitive scalps, and moisturizes damaged hair<sup>[7]</sup>.

#### Benefits of flax seeds for hairs

The following elements can provide certain advantages for hair<sup>[15, 16, 17, 18]</sup>:

- **Omega-3 fatty acids:** Vitamins, proteins, and other nutrients are provided to the hair and scalp by omega-3 fatty acids. It also helps reduce hair loss and prevents inflammation of the hair follicles. It may also promote hair growth by increasing blood circulation in the scalp.
- **Anti-oxidants:** Lignin is an antioxidant found in flaxseeds. The antibacterial qualities of lignin efficiently inhibit or obstruct the growth of germs. Lignin also reduces hair loss and promotes hair growth.
- **Fiber:** Fiber is an essential ingredient that any hair product should contain. This structure's primary protein component is katanin. Extra fiber is a component of many hair products that hide and lessen hair breakage. Fiber is a very effective way to hide thinning or lost hair.
- **Vitamin E:** Vitamin E, an antioxidant that is essential for supporting the growth of hair, is abundant in flaxseeds. By preventing the scalp tissue's vital nutrients from being depleted, vitamin E prevents hair loss. As a result, this facilitates the scalp's proper nutrition and encourages hair development. The beneficial effects of vitamin E on hair growth are widely known. Vitamin E nourishes hair and stops hair loss. Additionally, vitamin E helps maintain our general health and energy<sup>[8]</sup>.

#### Conclusion

The present review shows that, flaxseed works well as a natural hair smoothing agent, giving hair strength, shining, and hydration. Antioxidants, fiber and omega-3 fatty acids all together to protect and nourish hair. Flaxseed is a wonderful supplement to any hair care regimen overall.

#### Acknowledgement

The authors thankful to Rungta Institute of Pharmaceutical Sciences, Bhilai, Chhattisgarh and Rungta Institute of Pharmaceutical Science and Research, Bhilai, Chhattisgarh for providing necessary facilities and database.

#### Conflict of Interest

The authors declare that no conflict of interest of any financial or other issues.

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