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## Physico-chemical composition of two linseed flour

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### Abstract

The study entitled “Physico-chemical composition of two linseed flour” was conducted to suggest value addition method for linseed. Two varieties namely Narendra Als<sub>1</sub> and Narendra Als<sub>3</sub> released by N.D.U.A & T, Kumarganj-Faizabad. The moisture (%), crude protein (%), crude fat (%), crude Fiber (%), total ash (%), carbohydrate (%), energy (kcal) and dry matter (%) content of Narendra Als<sub>1</sub> were 3.90, 24.60, 38.60, 6.96, 4.40, 21.54, 532 and 96.1 percent respectively whereas in Narendra Als<sub>3</sub> the respective value were 4.50, 26.51, 36.40, 7.03, 3.50, 22.06, 522 and 99.5 respectively.

**Keywords:** Linseed flour, Refined wheat flour based products, Proximate composition, Shelf life and sensory characteristics

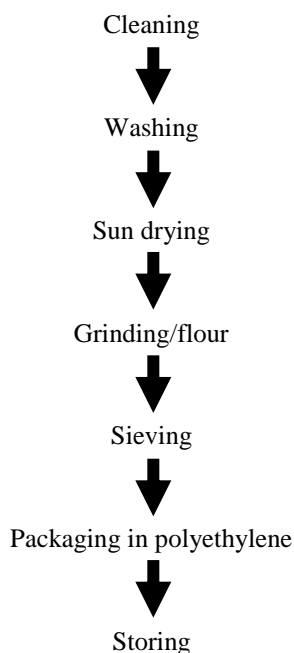
### Introduction

Flaxseed, or linseed (*Linum usitatissimum* L.), popularly known as *Alsi* in Indian language, is a cool temperate annual herb belongs to the family Lineaceae and the genus *Linum*. Flaxseed possesses crispy texture and nutty taste. The use of flaxseed as a dietary supplement is increasing due to its multitudinous effects on human health. Water-binding capacity of flaxseed insoluble fibre increases the intestinal bulk which is useful in the treatment of constipation, irritable bowel syndrome and diverticular disease. Flax oil has a very healthy fatty acid profile, with low level (approximately 9%) of saturated fatty acids (palmitic and stearic), moderate level (18%) of monounsaturated fatty acids (mainly oleic acid) and high concentration (73%) of polyunsaturated fatty acid (PUFA) (Morries, 2004; Ranjzad *et al.*, 2007) [11, 13]. Linseed is also rich in lignin's, phytochemical that are showing promise for their potential benefits for both men and women health. Lignans has astrogen that helps to regularise hormonal imbalance in women. Linseed seeds have 40 percent fat, 21 percent of good quality protein, 10 percent crude fibre, 6 percent carbohydrates and 4 percent ash which is rich in minerals specially calcium, magnesium, phosphorus and zinc (Halina *et al.*, 2003; Gopalan *et al.*, 2004; Singh, 2009) [7, 6, 15]. Linseed can be added as a whole or ground in baked products like bread, muffin, pancake, cookies etc. imparting a healthy appearance and increased texture quality (Burgland, 2002; Rubilar *et al.*, 2010; Singh *et al.*, 2011; Martinchik *et al.*, 2012) [3, 14, 16, 9].

### Materials and Methods

#### Procurement of sample

Linseed corms of two varieties namely Narendra Als<sub>1</sub> and Narendra Als<sub>3</sub> released by Narendra Deva University of Agriculture and Technology, Kumarganj- Faizabad. They were selected for this study and were procured from the Department of (GPB) in NDUAT Kumarganj - Faizabad. Other materials required for preparation of value added products were procured from the local market of Kumarganj. Flow diagram of flour preparation is given below:

**Procurement of linseed (*Linum Usitatissimum* L.)****Fig 1:** Flow diagram of linseed flour**1. Nutritional composition of Linseed, (*Linum usitatissimum* L.)**

The nutritional composition of linseed was determined using following method:-

**1.1 Moisture, Crude protein, Crude Fat, Crude fibre and Total Ash**

Moisture content, crude protein, crude fat, crude fiber and total ash was determined by employing the standard method of analysis (AOAC, 2000) [2]. Using KEL PLUS Automatic Nitrogen Estimation System & Automatic SOCS plus Solvent Extraction System.

**1.2 Dry matter**

Moisture value was subtracted from 100; the difference gave values of available dry matter

$$\text{Dry matter (\%)} = 100 - \text{Moisture value}$$

**1.3 Carbohydrates**

Added the values of moisture, crude protein, crude fat, crude fibre, total ash and subtracted from 100. The difference gave the values of available carbohydrate.

$$\text{Carbohydrate (\%)} = 100 - (\text{Moisture} + \text{crude protein} + \text{crude fat} + \text{crude fibre} + \text{total ash}).$$

**1.4 Energy**

The energy content was calculated by factorial method.

$$\text{Energy (kcal)} = 4x \text{ carbohydrate} + 4x \text{ crude protein} + 9x \text{ crude fat}$$

**Results and Discussion**

The result of the present study has been summarized below:

The data presented in Table 1 illustrated the nutritional composition of linseed flour on dry matter basis

**Table 1:** Nutritional composition of selected varieties of linseed flour

Parameters	Variety	
	Narendra Als <sub>1</sub>	Narendra Als <sub>3</sub>
Moisture (%)	3.90	4.50
Crude protein (%)	24.60	26.51
Crude fat (%)	38.60	36.40
Crude Fiber (%)	6.96	7.03
Total ash (%)	4.40	3.50
Carbohydrate (%)	21.54	22.06
Energy(kcal)	532	522
Dry matter (%)	96.1	95.5

The moisture (%), crude protein (%), crude fat (%), crude Fiber (%), total ash (%), carbohydrate (%), energy (kcal) and dry matter (%) content of Narendra Als<sub>1</sub> were 3.90, 24.60, 38.60, 6.96, 4.40, 21.54, 532 and 96.1 percent respectively whereas in Narendra Als<sub>3</sub> the respective value were 4.50, 26.51, 36.40, 7.03, 3.50, 22.06, 522 and 95.5 percent respectively. Dubey *et al.* (2009) [5] documented consistent values of fat content ranging between 33 to 34 percent in four varieties of flaxseed grown in Kanpur, Nagpur and Raipur areas, while wide variation in fat content ranging between 29.40 to 42.60 percent. Fiber 4.8 g, carbohydrate 28.9 g, energy 530 Kcal, carotene 0.23 µg, thiamine 0.23 mg, riboflavin 0.07 mg, niacin 1.0 mg, phosphorous 370 mg and iron 2.7 mg. Hussain *et al.* (2008) [8] evaluated the chemical composition of roasted and non roasted full fat flaxseed (*Linum usitatissimum* L.) flours. Moisture content of full fat non roasted (FFNR) flaxseed flour had highest value (4.53%) where full fat roasted (FFR) flour had 4.23 percent. FFR flaxseed flour had the protein, crude fat, ash as 21.27, 38.53, 3.48 and 24.37 percent.

**Conclusion**

Linseed has nutritional and functional properties. Consumer

demand is increasing day by day for nutritional and health promoting foods. Linseed are not only source of carbohydrate and oil but are also a key factor in ones diet due to the presence of many protective factors such as dietary fibres, lignans etc. People should be encouraged to consume linseed as it has numerous health benefits besides being nutritionally sound. To popularize linseed among common people its incorporation/substitution in traditional recipes could be one way.

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