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# Preparation and Standardization of Flaxseed, Sesame Seed and Garlic Chutney and Assessment of Acceptability through Sensory Evaluation

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### Abstract

In present investigation a flaxseed, sesame seed and garlic chutney was prepared in three samples A, B, C with different proportions, i.e. 1:1, 2:1 and 3:1 respectively. Standardization of flaxseed and sesame seed chutney was done to check the acceptability and ensure fixed nutritional content and ease of preparation. Proximate analysis of all three products and raw ingredients was conducted. There was no significant difference in nutritional quality of all three products, however ranking can be done on the basis of sensory evaluation. Product A stood third, product C stood second and product B stood first in overall acceptability of the product. The intension of this investigation was to promote incorporation of Flaxseed, sesame seed and garlic chutney as a concentrated source of omega 3 fatty acid (Alpha Linoleic Acid), fibre and many other nutrients with medicinal properties as well as minerals like calcium, iron in the regular meals of common people.

**Keywords:** Chutney, Flaxseed, Sesame seeds, Garlic, alpha linoleic acid, omega 3 fatty acid, Allicin, Calcium, Iron, Phosphorous, fibre, Standardization, Sensory Evaluation, Acceptability.

### Introduction

Chutneys had been an integral part of a ceremonial/traditional meal from ancient times specially in Indian families. There are variety of chutneys which are used in ceremonial or festival menu. However, the type of chutney used may differ with geographical regions, or even community wise. But their integral position in Indian meals, no one could change, rather variations as per taste, texture, availability of the raw ingredients and shelf life are common in day-to-day practice.

Chutneys have a very important role in nutritional completion, appearance and overall acceptability of a meal. Now a days meal is considered incomplete without chutneys. We can see chutneys as a flavoring ingredient in meal as well as a source of micro-nutrients in a meal 91 [1].

Present study was aimed to develop and standardize flaxseed, sesame seed and garlic chutney as a concentrated source of omega 3 fatty acid (Alpha Linoleic Acid), fibre and many other nutrients with medicinal properties as well as minerals like calcium, iron in the regular meals of common people, for the prevention of so many fatal diseases and to assess the overall acceptability of the product with reference to various sensory parameters like appearance, aroma, texture and taste. Cost and storage period was also considered.



Fig 1: Flaxseed, Sesame Seed and Garlic Chutney

### Importance of Standardization of Recipe

All recipes may not be equally perfect although the person preparing is same everytime. There may be some lacunas in taking quantity or in preparation in absence of a standardized recipe, which may vary or affect the acceptability of the

product. A Standardized recipe is a set of written instructions used to consistently prepare a known quantity and quality of food. A standardized recipe will produce a product which is very close to identical in taste and in yield every time it is prepared and no matter if the person preparing is changed or same. Standardized recipe has very important role in food industry either on large or small scale. Through use of a standardized recipe, one can achieve a consistent quality, quantity, standard portion size and cost assuring nutritional content and addressing dietary concerns, such as in case of therapeutic diets or food allergies. It aids in purchasing raw ingredients, work simplification, training of new staff, curtail wastage and most importantly can satisfy consumer <sup>[1,2]</sup>.

Sensory evaluation has been defined as a scientific discipline used to evoke, measure, analyze, and interpret human reactions to food product's sensory characteristics as perceived by sight, smell, taste, touch, and hearing by the Institute of Food Technologists (IFT). Sensory science has been recognized as a scientific discipline and sensory evaluation is used as a component to judge quality, shelf-life, and consumer acceptance of the food products <sup>[3]</sup>.

Sensory evaluation is necessary before marketing to ensure the acceptability of a food product by the consumers. Sensory evaluation is a statistical analysis method based on human sensory perception, which is carried out under double-blind conditions. When compared with other detection and analysis methods, sensory evaluation can not only measure the taste of food, but also detect changes in aroma, color, surface features, and taste perception. The results of a sensory evaluation can provide the necessary grounds for adjusting the taste to satisfy the consumer <sup>[1,4]</sup>.

Flax seeds (*Linum usitatissimum*) also known as common flax or linseeds are small oil seeds that originated in the Middle East thousands of years ago. Flaxseed is used in Indian Kitchens from ancient times. They were aware about its nutritional importance from very period. But our ancestors failed in communication about nutritional importance of many food stuffs. From last few years, flaxseed have become popular for their nutritional importance, especially for their high content of heart- healthy Omega -3 essential fatty acid ALA (Alpha Linoleic Acid), minerals, fibre and unique antioxidants. Total fat content of flaxseed is 42.16g, out of which 3.66g is saturated, 28.7 polyunsaturated and 7.53g monounsaturated. Flaxseeds are most easily available and cheapest source of Omega 3 Fatty acid, within the reach of any person.

Flaxseeds are proved to be highly beneficial to improve digestion, reduce risk of heart disease, type 2 diabetes and cancer. Flaxseed can be easily incorporated in diet. They are better utilized by the body in ground form rather than whole. for extracting the maximum nutrition out of it <sup>[5]</sup>.

Sesame seed is a very good source of protein, fiber, and healthy fats. Provide Vitamins E and B liberally and is a rich source of minerals like Calcium, Iron, Phosphorus especially Copper which supports immune system function <sup>[6]</sup>.

Eating garlic regularly could boost your immune system and support heart health. Garlic may help reduce cholesterol and blood pressure, improve liver health, support the gut microbiome and reduces the risk of various types of cancer. Garlic contains the following bioactive compounds <sup>[7]</sup>.

- Alliin – lowers blood cholesterol, reduce blood pressure and fights harmful bacteria and fungi.
- Alliin- Alliinase converts alliin to allicin.
- Diallyl sulfide – Promotes cardiovascular health, antioxidant, supports immune function.

- Diallyl disulfide - Anti cancerous, Anti-inflammatory, Anti-microbial
- Diallyl trisulfide – Anticancerous, prevents blood clots, kidney and Liver protection, increases insulin secretion etc.
- Ajoene – Antifungal, antimicrobial, antiviral, cardiovascular and anticancer. It is stable compared to allicin.
- S-allyl-cystein - Reduces LDL cholesterol, Antioxidant, Immune defense, combats insulin resistance, regulate glucose metabolism, prevents excess lipid accumulation, healthy brain and liver function, suppress cancer cell proliferation and induces apoptosis (programmed cell death) in tumor cells.

In short Garlic has unnumbered medicinal properties. So regular consumption of raw garlic can prevent the onset of various fatal health hazards.

### Materials and Methods

For this investigation following material and methods were used.

### Preparation of Chutney

Flaxseed

Sesame Seeds

Garlic: 10 g/100g of all ingredients mixture.

Cumin seeds: 10g/100 g of all ingredient's mixture.

Dry Red Chilies: 5g/100 g of all ingredient's mixture.

Salt: 10g/100 g of all ingredient's mixture.

Sunflower Oil – 10g

### Method

All ingredients were cleaned; sesame seed were washed and dried in shade., Flaxseed, cumin seed and sesame seed were roasted at medium temperature in specific proportions as per sample A, B and C separately. Dry red chilies were fried in sunflower oil separately. Garlic cloves were peeled. A small portion of roasted sesame seeds was kept aside and remaining all ingredients were ground to a coarse powder in mixer grinder. Then roasted sesame seeds kept aside were added to ground mixture. Mixed well and kept in a dry, non-transparent, air tight container. Special care was taken for maintaining hygiene.

### Selection of Sensory Evaluation Panel

Balanced individuals were selected as panel member for this purpose. Their evaluation skill was tested. Three samples of the product were kept for this test. In these three samples two were identical in proportions, and third sample was prepared with minor difference in proportions, though all three were looking same. Individuals were asked to evaluate the products. Individuals who could recognize the same sample were selected as a panel member for the sensory evaluation. All the members of sensory evaluation panel were asked to give score out of 10 to sample A, B and C.

Score shall be

10 - Very good.

9 - Good.

8 - Fair.

### Proximate Analysis

Proximate analysis of all ingredients and samples was done in MIT College, Sambhajinagar with standardized methods.

## Results and Discussion

**Table 1:** Nutritional content of Flaxseed, Sesame Seed, Garlic, Cumin seeds and Dry Red Chillis per 100g (6).

| Nutrient         | Protein (g) | Fat (g) | Minerals (g) | Fibre (g) | CHOs (g) | Energy (Kcal) | Calcium (mg) | Phos (mg) | Iron (mg) |
|------------------|-------------|---------|--------------|-----------|----------|---------------|--------------|-----------|-----------|
| Flaxseed         | 18.4        | 42.3    | 6.8          | 27.54     | 28.89    | 534           | 255          | 642       | 5.7       |
| Sesame Seeds     | 18.3        | 43.3    | 5.2          | 2.9       | 25.0     | 563           | 1450         | 570       | 9.3       |
| Garlic           | 6.4         | 0.5     | 3.4          | 2.1       | 33.1     | 149           | 181          | 153       | 1.7       |
| Cumin Seeds      | 18.7        | 15.0    | 5.8          | 12.0      | 36.6     | 356           | 1080         | 511       | 11.7      |
| Dry Red Chillies | 15.9        | 6.2     | 6.1          | 30.2      | 31.6     | 246           | 160          | 370       | 2.3       |

In sample A proportion of flaxseed and sesame seed is 1:1 i.e. both are taken in same quantity. In Sample B percentage of flaxseed and sesame seed is 2:1 and in Sample C percentage of flaxseed and sesame seed is 3:1. However quantity of

Garlic, Cumin seeds, and dry chillis is same in all i.e. 10 g, 10g, and 5g respectively. Even, quantity of the salt (10g) used is also same in all the three products A, B and C.

**Table 2:** Nutritional Content Per 100g of Sample A (Flaxseed 50% + Sesame Seed 50% i.e. proportion 1:1)

| Nutrient       | Protein (g) | Fat (g) | Minerals (g) | Fibre (g) | CHOs (g) | Energy (Kcal) | Calcium (mg) | Phos (mg) | Iron (mg) |
|----------------|-------------|---------|--------------|-----------|----------|---------------|--------------|-----------|-----------|
| Total          | 21.66       | 44.66   | 7.23         | 18.14     | 35.5     | 611           | 987          | 691       | 10        |
| Value per 10 g | 2.17        | 4.5     | 0.72         | 1.81      | 3.55     | 61            | 98.7         | 69.1      | 1.0       |

**Table 3:** Nutritional Content Per 100g of Sample B (Flaxseed 66.66% + Sesame seeds 33.33% i.e. proportion 2:1)

| Nutrient       | Protein (g) | Fat (g) | Minerals (g) | Fibre (g) | CHOs (g) | Energy (Kcal) | Calcium (mg) | Phos (mg) | Iron (mg) |
|----------------|-------------|---------|--------------|-----------|----------|---------------|--------------|-----------|-----------|
| Total          | 21.67       | 44.49   | 7.49         | 22.24     | 36.14    | 606           | 787          | 703       | 9.38      |
| Value per 10 g | 2.17        | 4.5     | 0.75         | 2.22      | 3.61     | 60.6          | 78.7         | 70.3      | 0.94      |

**Table 4:** Nutritional Content Per 100g of Sample C (Flaxseed 75% + Sesame seeds 25% i.e. proportion 3:1)

| Nutrient       | Protein (g) | Fat (g) | Minerals (g) | Fibre (g) | CHOs (g) | Energy (Kcal) | Calcium (mg) | Phos (mg) | Iron (mg) |
|----------------|-------------|---------|--------------|-----------|----------|---------------|--------------|-----------|-----------|
| Total          | 21.68       | 44.41   | 7.63         | 24.3      | 36.47    | 604           | 688          | 709       | 9.09      |
| Value per 10 g | 2.17        | 4.4     | 0.76         | 2.43      | 3.65     | 60.4          | 68.8         | 70.9      | 0.91      |

Difference in nutritional content of all three products is insignificant, however if we consider 10g serving of chutney, it supplies good quantity all nutrients in such small serving size, It can prove good source of Omega 3 fatty acid and fibre

as well as protein, fat, energy and especially minerals i.e. Calcium, Phosphorous and Iron in daily diet. (Table 2,3 and 4)

**Table 5:** Sensory Evaluation Average Score for Appearance (Sight), Aroma, Texture, Hearing and Taste.

| Qualities  | Sample A | Sample B | Sample C |
|------------|----------|----------|----------|
| Appearance | 10       | 10       | 09       |
| Aroma      | 10       | 10       | 10       |
| Touch      | 09       | 10       | 08       |
| Hearing    | 09       | 10       | 08       |
| Taste      | 10       | 10       | 09       |
| Total      | 48       | 50       | 44       |

From the average score for appearance. Aroma, touch, hearing and taste mentioned in table 5, it can be stated that though there is no significant difference in/between Sample A, B and C, acceptability of the product B is consistently better in all parameters of sensory evaluation. Followed by Product A and product C is lowest in average. Though score of sensory evaluation is different for all three when compared but when served single all were acceptable.

### Summary and Conclusions

For promoting the use of flaxseed, sesame seed and garlic together in daily meals of common people, as a concentrated and easily available source of Omega 3 Fatty acids and many other nutrients with medicinal properties, three samples of Flaxseed, Sesame Seed and Garlic chutney with different

proportion were prepared. Sample B (proportion 2:1) ranked first, followed by Sample A (proportion 1:1) and Sample C (proportion 3:1) respectively.

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