Sesame (Sesamum indicum L.) seed as a functional food: A review

Priyanka Nagar, Mukta Agrawal and Kailash Agrawal

Abstract

Oilseeds contain high amounts of macro and micronutrients. Sesame also known as Gingelly. Beniseed and til (Hindi) is one of the oldest and most extensively consumed oilseeds and is used in various food preparations in the form of seeds, oil, meal cake, and other by-products. Sesame has good content of iron, zinc, calcium, phosphorus and magnesium, which are essential to our overall health due to their various nutraceutical, medicinal and pharmacological qualities. Sesame provides numerous health advantages, including hypocholesterolaemic, managing blood pressure, managing dermatological diseases, and many more. Sesame, a good source of micronutrients, can correct micronutrient deficiencies thus acting as a functional food to cater to every age group and the same has been reviewed.

Keywords: Functional food, macronutrients, micronutrients, oilseed, sesame seed

Introduction

Oilseeds are an excellent source of macro and micronutrients that help to combat micronutrient deficiencies (Deme et al., 2017) [12] and are cultivated worldwide (Yaseen et al., 2021) [30] and provide enormous health benefits (Muhammad et al., 2013; Morya et al., 2022) [29, 28]. Recently, the demand for sesame is expanding among the oilseeds due to its commercial, nutritional and medicinal importance (Ölmez and Sevilmiş, 2021; Zhang et al., 2021) [31, 41]. India is the world's second highest exporter of sesame seeds, with the production of 658000 tonnes in 2020 and ranks first in the export quantity of sesame oil and sesame seed cake globally (FAO, 2020). In Rajasthan State, the various oilseeds produced are sesamum, groundnut, soybean, castor seed, mustard, taramira and linseed (Negi and Pandya, 2021) [30]. Among the oilseeds, sesame seeds are an excellent source of macro as well as micronutrients (Anilkumar et al., 2010; Longvah et al., 2017) [6, 25] due to which also known as the "queen of oilseeds" (Biswa et al., 2018) [10]. Sesame is used in making various food preparations and used directly along with its by-products at a large scale in industries of medicine, nutrition, cosmetics etc. (Yaseen et al., 2021; Morsy et al., 2022) [27, 28].

Uses

Sesame is used as whole seeds, oil and meal cake in the form of powder and other by-products (Melo et al., 2021) [6] for various food preparations acting as a functional, medicinal, nutraceutical, therapeutic and pharmaceutical source. Sesame and its by-products are rich in protein, fatty acids, antioxidants and other macro and micro nutrients that may help combat hidden hunger (Table 1).

Sesame as a functional food

Being rich in calcium, iron and zinc, sesame is utilized as a functional food (Anilkumar et al., 2010; Asghar et al., 2014; Amandeep et al., 2019) [6, 8, 4]. The seeds are used in various savory food preparations namely khaman dhokla, pulao, snacks like chilly paneer, as well as sweet conventional food preparations such as gajak, revadi, chikki, tilpatti, laddoos, barfi, sweets, as sprinkler, in chutneys made from either whole or coarsely grounded flour are popular. Sesame seed meal may be combined with other foods to create value-added products that can aid in improving daily diets at a lower cost. It may improve the nutritional status and combat malnutrition (Beloucif et al., 2022; Karnika et al., 2022) [9].

Majorly it is used as a source of oil and meal and remaining for food and confectionery industries (Kapoor et al., 2015) [9]. Sesame seeds are used for its oil due to high amount of

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Sesame is an important oilseed crop that is a good source of vegetable oil with a good fatty acid composition. It is rich in protein, calcium, iron, zinc and bear good antioxidant activity, making it an excellent functional food source to fulfill nutritional needs. It is used in culinary, nutraceutical, pharmaceutical, medicinal and ayurvedic industries. It is used in food, including bakery products, salads in the form of oil. The meal cake of sesame is also used to develop value in food, including bakery products, salads in the form of oil. The meal cake of sesame is also used to develop value

### Table 1: Nutritional composition of different types of sesame seeds

<table>
<thead>
<tr>
<th>Nutrients (per 100g)</th>
<th>Type of sesame seeds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
</tr>
<tr>
<td><strong>Macronutrients</strong></td>
<td></td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>10.83</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>21.7</td>
</tr>
<tr>
<td>Total fat (g)</td>
<td>43.05</td>
</tr>
<tr>
<td>Omega-3 fats (mg)</td>
<td>120</td>
</tr>
<tr>
<td>Linoleic acid (mg)</td>
<td>18477</td>
</tr>
<tr>
<td>Moisture (g)</td>
<td>3.3</td>
</tr>
<tr>
<td>Ash (g)</td>
<td>4.13</td>
</tr>
<tr>
<td>Total fiber (g)</td>
<td>16.99</td>
</tr>
<tr>
<td>Soluble fiber (g)</td>
<td>3.51</td>
</tr>
<tr>
<td>Insoluble fiber (g)</td>
<td>13.49</td>
</tr>
<tr>
<td><strong>Micronutrients</strong></td>
<td></td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>1238</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>15.04</td>
</tr>
<tr>
<td>Zinc (mg)</td>
<td>7.77</td>
</tr>
<tr>
<td>Phosphorus (mg)</td>
<td>754</td>
</tr>
<tr>
<td>Magnesium (mg)</td>
<td>372</td>
</tr>
<tr>
<td>Manganese (mg)</td>
<td>1.74</td>
</tr>
<tr>
<td>Total folate/Vit B9 (mcg)</td>
<td>131</td>
</tr>
<tr>
<td>Vitamin E (mg)</td>
<td>1.26</td>
</tr>
<tr>
<td>Alpha Tocopherol (mcg)</td>
<td>1240</td>
</tr>
<tr>
<td>Ergocalciferol (D2) (mcg)</td>
<td>62.74</td>
</tr>
<tr>
<td>Total polyphenols (mg)</td>
<td>23</td>
</tr>
</tbody>
</table>

*After Longvah et al., 2017 [25]*

**Conclusions**
Sesame is an important oilseed crop that is a good source of vegetable oil with a good fatty acid composition. It is rich in protein, calcium, iron, zinc and bear good antioxidant activity, making it an excellent functional food source to fulfill nutritional needs. It is used in culinary, nutraceutical, pharmaceutical, medicinal and ayurvedic industries. It is used in food, including bakery products, salads in the form of oil. The meal cake of sesame is also used to develop value-added food products. Therefore, sesame which is available worldwide can be a great source of macro and micronutrients, providing a great package of health benefits. It can be used to combat macro as well as micronutrient malnutrition.
References


27. Morsy MK, Sami R, Algarini E, Al-Mushhinh AA, Benajiba N, Almasoudi AG, Meikawi E. Phytochemical profile and antioxidant activity of sesame seed (Sesamum indicum) by-products for stability and shelf life


41. Zhang, H, Langham, D, Miao, H. Economic and academic importance of sesame. The Sesame Genome. Springer, Cham, 2021, 1-18. https://doi.org/10.1007/978-3-319-98098-0_1