

# Palm Oil: Fulfilling a Key Role in Meeting India's Edible Oils and Fats Requirements

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## INTRODUCTION

India is currently the fifth largest global economy with a gross domestic product (GDP) of USD3.53 trillion (Armstrong, 2022). With a population of 1.39 billion, India is the world's second most populous nation. The economic growth potential and huge population base makes India an economic powerhouse hungry for various consumer goods, and in particular food products. India is, therefore, an important market for edible oils and fats, both for direct household consumption and as an indispensable ingredient for several sub-sectors of the country's food industry.

## INDIAN EDIBLE OIL SCENARIO

India is one of the world's major oilseed economies, with oilseed crops occupying 28.8 million hectares (16.3%) of the country's planted area for major crops (176.6 million hectares) in 2020-2021 (MoA&FW, 2022). There are nine primary oilseed crops cultivated in India, of which seven (*i.e.*, rapeseed-mustard, soybean, groundnut, sesameseed, sunflowerseed, nigerseed and safflowerseed) are sources of edible oils; while two (*i.e.*, castorseed and linseed) provide non-edible oils. Besides these primary sources, vegetable oils may also be obtained from secondary sources, comprising cottonseed, rice bran, coconut, solvent-extracted oils, oil palm and oils from trees and forest origin (NMOOP, 2018). *Table 1* shows the recent trends in India's domestic vegetable oils production from primary and secondary sources. Primary sources contribute to about 70% of India's domestic vegetable oils production, with rapeseed-mustard, soybean and groundnut as the leading oilseeds, collectively accounting for about 60% of the vegetable oils produced.

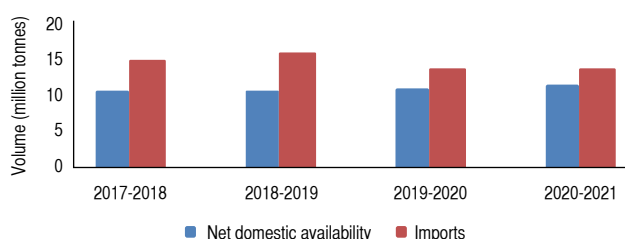
**TABLE 1. INDIA: PRODUCTION OF VEGETABLE OILS FROM PRIMARY AND SECONDARY SOURCES (2018-2019 to 2020-2021, November-October)**

Oilseed/Source of oil	Quantity ('000 t)		
	2018-2019	2019-2020	2020-2021
<b>Primary Source:</b>			
Rapeseed-Mustard	2 897	2 828	3 137
Soybean	2 209	1 797	2 066
Groundnut	1 518	2 290	2 316
Sunflower seed	73	72	76
Sesame seed	236	234	253
Niger seed	19	12	11
Safflower seed	7	9	11
Castor seed	427	650	580
Linseed	40	28	28
<i>Sub- Total (Primary Sources)</i>	<i>7 426</i>	<i>7 920</i>	<i>8 478</i>
<b>Secondary Source:</b>			
Coconut	590	595	595
Oil palm	270	277	277
Cotton seed	1 123	1 271	1 226
Rice bran	1 068	1 068	1 068
Solvent-extracted	325	350	350
Tree and Forest Origin	150	150	150
<i>Sub-Total (Secondary Sources)</i>	<i>3 526</i>	<i>3 711</i>	<i>3 666</i>
<b>Total</b>	<b>10 952</b>	<b>11 631</b>	<b>12 144</b>

Source: Department of Food and Public Distribution (2022).

Edible oil production growth rate has not been encouraging, as oilseed production faces several constraints, such as lack of suitable land for expansion, high dependency on monsoon rains, and technological

challenges (Department of Food and Public Distribution, 2021; Desai, 2021; Sharma, 2014). The demand and consumption of edible oils in India is driven by increasing population and steady economic growth, and is estimated to increase by about 2%-3% per annum (Jadhav, 2021; Patel, 2019). However, as India's edible oil production growth rate has not been able to match the demand growth, the supply-demand gap necessitates imports of edible oils of up to 15 million tonnes per annum (Figure 1). Hence, India is the world's leading vegetable oil importer, ahead of China and the European Union (FAS, 2022).

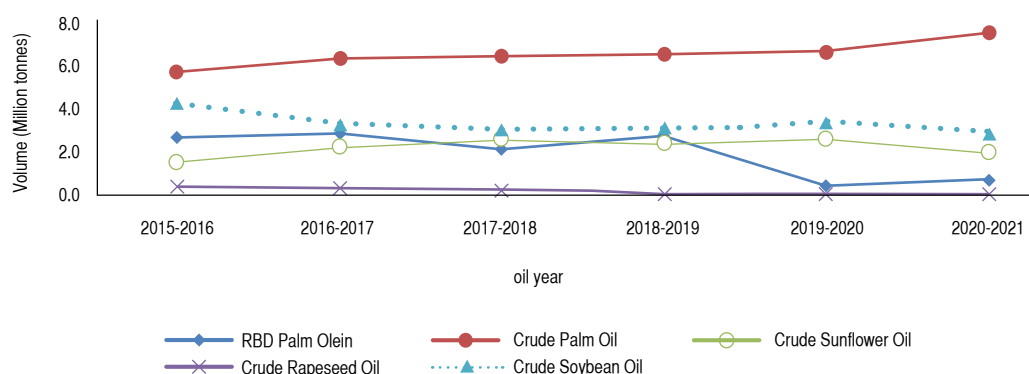


Source: Department of Food and Public Distribution (2022).

Figure 1. India: Net domestic availability of edible oils and imports.

As shown in Figure 2, the major edible oils imported by India are crude palm oil (CPO), crude soybean oil, refined bleached deodorised (RBD) palm olein, crude sunflower oil and crude rapeseed oil. CPO and RBD palm olein are sourced mainly from Malaysia and Indonesia; soybean oil from Argentina and Brazil; and sunflower oil from Ukraine (Department of Food and Public Distribution, 2022). The demand trends for edible oils are influenced by economic growth and price factors, particularly the discount between

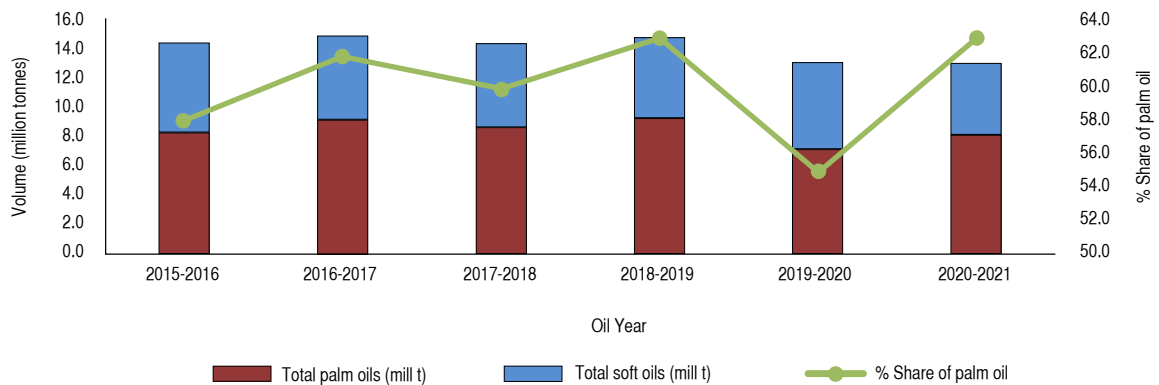
palm oil and soybean oil (Zakaria *et al.*, 2017). The total imports of palm oil (sum of CPO and RBD palm olein) compared to crude soft oils (soybean, sunflower and rapeseed oils) are shown in Figure 3. It can be seen that the share of palm oil had been above 60% over the period 2016-2017 to 2018-2019, but recorded a significant drop to 55% in 2019-2020, before recovering to 63% in 2020-2021. The decline in palm oil imports by India during the 2019-2020 period may be attributed to two major reasons. The first is attributable to the COVID-19 pandemic-induced lockdown which had resulted in the closure, for a period of more than three months, of the country's hotels, restaurants and catering (HoReCa) sector, which accounts for almost 65% of India's palm oil demand (Desai, 2020). At the same time, the demand for soft oils that are the mainstay of household consumption remained stable, and this resulted in an increase of soft oils' share in India's import basket in 2019-2020 (Chaturvedi, 2021). Another contributor to the drop in total palm oil share in India's edible oils import basket in 2019-2020 was the steep decline in the imports of RBD palm olein from 2.73 million tonnes (2018-2019) to a mere 0.42 million tonnes (2019-2020). This decline was caused by the restrictions on imports of RBD palm oil and RBD palm olein to India, which came into force 8 January 2020 when India's Directorate General of Foreign Trade (DGFT) issued Notification No. 39/2015-2020 (DGFT, 2020), which placed refined palm oil and palm olein under the restricted category, requiring import licence. Though total palm oil imports by India in 2020-2021 recovered to 8.32 million tonnes, this was mainly CPO (7.49 million tonnes), while RBD palm olein import was 0.69 million tonnes.



Source: SEA (2020; 2021).

Figure 2. India: import trends of major edible oils (2015-2016 to 2020-2021, November to October).

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Source: SEA (2020; 2021).

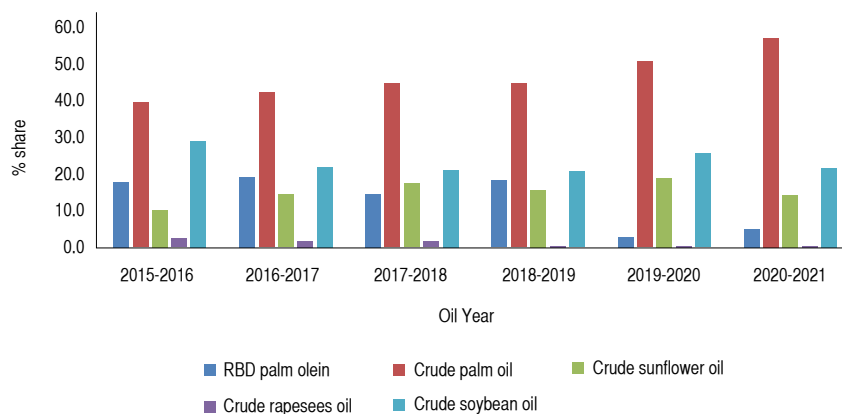
Figure 3. India: Total edible oil imports and palm oil share of imports (2015-2016 to 2020-2021, November to October).

Crude soybean oil has been the second major edible oil imported into India, and its share of edible oil imports ranged between 20% and 30% over the period 2015-2016 to 2020-2021 (Figure 4). Share of sunflower oil in the edible oils import basket during this period ranged between 10% and 19%.

According to the Department of Food and Public Distribution (2022), total consumption of edible oils in India had reached 25.92 million tonnes in 2018-2019, with per capita consumption at 21.6 kg. However, the estimated consumption of edible oils in 2020-2021 declined to 24.61 million tonnes, and consequently per capita consumption dipped to 19.7 kg (Department of Food and Public Distribution, 2022). Demand growth for edible oil in India had been propelled by the growing population, increasing income levels, higher level of urbanisation and the resulting changes in food habits (Singh, 2019). Nonetheless, future

demand for edible oils would remain robust, and it has been projected that over the period 2019-2028, India's edible oil imports would grow at an annual rate of 3.7% to reach 22 million tonnes to meet India's consumption requirements (OECD-FAO, 2019).

The consumption of edible oils in India may be categorised on a regional basis as summarised in Table 2 (Patel, 2019). Notwithstanding the regional preference for certain edible oils, palm oil consumption is almost ubiquitous in India. The consumption of palm oil in India has increased steadily over the years, from 2.94 million tonnes, accounting for 29.1% of India's edible oil consumption in 2001-2002 to 8.72 million tonnes (39.2% of consumption) in 2017-2018 (Patel, 2019). Consumption of palm oil in 2020-2021 totalled 8.23 million tonnes, accounting for 38% of India's edible oils consumption (Mehta, 2022).



Source: SEA (2020; 2021).

Figure 4. India: Percentage share of imports for major edible oils (2015-2016 to 2020-2021, November to October).

**TABLE 2. INDIA : REGIONAL CONSUMPTION PATTERN FOR EDIBLE OILS**

Region/States	Consumption pattern
Northern India (Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Uttaranchal, Uttar Pradesh)	Traditional preference for mustard oil. Soybean oil is gaining popularity for household use. Palm oil is used in HoReCa sector.
Southern India (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana)	The highest consumer of palm oil, > 60% market share is for palm oil. India's leading market for sunflower oil, small share of soybean oil.
Eastern India (Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, West Bengal)	India's biggest market for mustard oil which has 18% share of the edible oils market. Palm oil has 48% share, and soybean oil of 12% share.
Western India (Goa, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan)	India's major consumer of soybean oil, 32% edible oil market share. Palm oil is the major oil consumed, 37% market share.

Source: Patel (2019).

Palm oil is well positioned to meet India's edible oil needs due to its versatility, overall price competitiveness, suitability for use in the bakery and confectionery industries, and importance in the HoReCa sector (Chaturvedi, 2021). Hence, the main growth in demand for palm oil comes from the Indian bakery, frying, confectionery, snack and fast foods and catering industries, as the versatile palm oil meets the functional needs of these sectors for food applications in India.

## INDIAN FOOD PROCESSING INDUSTRY

As one of India's largest industries, the food processing sector offers huge potential growth, value addition and high profits; and is ranked fifth in terms of production, consumption, export and expected growth, while contributing 13% of India's exports and 6% of the total industrial investment (Veer and Virkar, 2021). The market for packaged food in India is expected to double in value to USD70 billion by 2025 (IBEF, 2021).

### Indian bakery sector

The Indian bakery industry is one of the biggest components within the country's processed food industry. It may be divided into three major sections, *i.e.*, biscuits, breads and cakes, where the former two collectively account for over 82% of the volume of production (Dalvi, 2021). In terms of biscuit production, India ranks second in the world, after the United States of America (Research and Markets, 2021). The future growth potential for bakery products in India is immense, as it has been projected

to grow at a compounded annual growth rate (CAGR) of 8.5% between 2021 and 2026, to reach a value of USD 12.39 billion (Dalvi, 2021).

The potential growth of the Indian bakery sector would lead to increased demand for bakery ingredients such as grain-based flours, yeast, liquids (water, milk, buttermilk etc.), bakery fats (*e.g.*, shortenings), sweeteners, eggs, salts and additives (flavourings, dough improvers *etc.*) (Balasundram and Kanagaratnam, 2019). Bakery fats and shortenings are essential ingredients that play an important role in bakery products, as they contribute towards several important attributes of these products, *i.e.*; tenderness, moistness, flavour, richness or mouthfeel, texture, leavening, lubrication, structure, and product shelf-life (Sharma, 2019).

Palm-based semi-solid fats can be utilised by the Indian bakery industry as bakery margarines and shortenings, bread and biscuit fats, biscuit cream fats, cream fillings, pastry fats, fondant fats and chocolate spreads. Palm-based solid fats offer the Indian bakery industry several characteristics desirable for the fats to be used, *i.e.*, mixed composition of high and low melting point fats, high solid fat content, contribution to structure, high oxidative stability, cost efficiency, and easy availability. Most importantly, palm-based bakery fats have the great advantage of being free of *trans* fatty acids, and this is an important attribute as the Food Safety and Standards Authority of India (FSSAI) has set a target to reduce the *trans* fatty acids content to 2% by 2022 (FSSAI, 2021).

Palm-based bakery fats can be tailor-made to achieve the specific functional characteristic required of the baked product - be it a pastry, biscuit or bread, by using the right fractions and in various combinations (Balasundram and Kanagaratnam, 2019). Palm-based oils and fractions can be simply blended to acquire the desired melting point of food products and fulfill certain functional roles and targeted melting points, *e.g.*, 33-50°C for shortenings and 30°C-42°C for margarines (*Table 3*). Different products (*e.g.*, margarines, shortenings, vanaspati, frying fats, confectionery fats and fats used in frozen desserts) may be made using different proportions of palm or palm kernel oils and their fractions (*Table 4*) (Balasundram and Kanagaratnam, 2019). In addition to the use of palm-based solid fats in bakery products, the liquid fraction of palm oil, *i.e.*, palm olein is often used as a spraying oil on some biscuits or crackers to give the final product a 'rich and smooth look' and improve palatability.

### Indian snack foods sector

India is a snacking powerhouse and the market value of this segment is estimated to be worth more than INR 1 billion by the end 2024 (Gupta, 2020). Fried snacks such as *namkeens* and chips, along with extruded snacks are the major snack food products consumed (Gupta, 2020). Snacks for specific purposes, such as elevating the mood, for on-the-go convenience, and snacks suitable for consumption during religious festival days are gaining popularity in India. Palm oil and palm olein are the most suitable oils to be used for deep fat frying in the snack foods industry, due to their high oxidative stability and smoke point. Palm oil and palm olein have high Oxidative Stability Index (OSI) and are therefore able to withstand oxidation, even when subjected to high temperatures (Minal, 2020). Many traditional Indian snack foods are also exported world-wide, and here stability and long-shelf life of products can be achieved by using palm oil or palm olein for frying these snacks.

### SUSTAINABILITY OF MALAYSIAN PALM OIL

While palm oil has been much maligned and unfairly accused of being unsustainable, the oil palm industry in Malaysia has always been giving importance to the three Pillars of Sustainability - People, Planet and Prosperity (3Ps). The industry has been self-regulating, with many of the plantation companies voluntarily engaging in sustainable production practices, incorporating good

agricultural and land management practices, natural resource conservation, integrated pest management, and minimisation of wastes and pollutants. The Malaysian Sustainable Palm Oil (MSPO) scheme which has been made mandatory effective 1 January 2020 ensures that Malaysian palm oil is produced in a sustainable manner, incorporating various environmentally-friendly practices; while continuing to support and uplift the rural communities, especially the smallholders. The scheme has also received international recognition as it has been adopted as a tool for the sustainable sourcing of palm oil for the Tokyo 2020 Olympic and Paralympic Games. There is currently collaboration between the Malaysian Palm Oil Certification Council (MPOCC) and the China Green Food Development Centre (CGFDC) on the recognition of MSPO certification. MSPO also features in the deliberations of the Technical Committee for National Initiatives for Sustainable and Climate-smart Oil Palm Smallholders (NI-SCOPS) under the Malaysia-Netherlands Sub-Committee on Oil Palm. In India, the development of the Indian Palm Oil Sustainability (IPOS) Framework was based on the MSPO. In addition, the Malaysian Palm Oil Board (MPOB) has a tripartite agreement with the Solvent Extractors' Association of India (SEA) and Solidaridad Network Asia Ltd. (SNAL) on Joint Promotion of MSPO and IPOS through harmonisation between the two standards.

### CONCLUSION

India's growing population, economic growth, urbanisation, rising disposable incomes, deeper penetration of processed foods, changing food habits and increased out-of-home consumption trends will drive India's vegetable oil consumption growth. Demand for palm oil would be supported by its price advantage, functionality for use in the food industry and increasing out-of-home consumption. Malaysian palm oil is sustainably produced as per national standards, that has received international recognition from several parties. Palm oil offers an attractive option for India's food processing industry and would help support its future growth.

### ACKNOWLEDGEMENT

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**TABLE 3. PALM AND PALM KERNEL OIL FRACTIONS AND THE DESIRED FUNCTION**

Palm Oil Fraction	High melting point fats	Medium melting point fats	Low melting point liquid oils
Functions	Acts as the backbone structure	Main body - imparts, structure, firmness and texture	Modifier to attain the required melting point
Suggested palm fractions	Palm stearin (hard) SMP above 52°C	Palm oil, Soft palm stearin (SMP below 45°C), Palm kernel oil Palm kernel stearin, Palm mid fractions	Palm olein, Palm kernel olein (or other liquid oils <i>e.g.</i> , soybean oil sunflower oil and canola oil)

Note source: SMP = Slip Melting Point. Teng et al. (2014).

**TABLE 4. RECOMMENDATIONS ON PERCENTAGE OF PALM AND PALM KERNEL OILS AND THEIR FRACTIONS IN PRODUCT FORMULATION**

Product	Recommended percentage of palm and palm kernel oil fractions		
Margarine	Palm stearin (IV 30 to 36) 5% to 10%	Palm oil 90% to 100%  Palm kernel oil 5% to 30%	Palm olein 5% to 50%
Shortening	Palm stearin (IV 30 to 36) 10% to 40%	Palm oil 90% to 100%	Palm olein 5% to 20%
Vanaspati	Palm stearin (IV 30 to 36) 10% to 40%	Palm oil 90% to 100%	Palm olein 5% to 20%
Frying fats	Palm stearin (IV 30 to 36) 10% to 40%	Palm oil 90% to 100%	Palm olein 5% to 80%
Confectionery fats	Palm stearin (IV 30 to 36) 5% to 15%	Palm mid fraction 80% to 100% Palm oil 20% to 30%  Palm kernel stearin 90% to 100%	Palm olein 5% to 15%
Fats for use in frozen desserts	Palm stearin (IV 30 to 36) 5% to 10%	Palm mid fraction 80% to 100%  Palm kernel oil 90% to 100%  Palm oil 20% to 40%	Palm olein 5% to 10%

Note: IV is iodine value. Palm mid fraction is obtained from fractionation of palm olein and is very widely used in the confectionery industry.

Source: Balasundram and Kanagaratnam (2019).

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