Parameters for Performance Review of Commodity

CRUDE SUNFLOWER OIL

1. Background

a. Brief about the commodity such as sample picture, lifecycle and various varieties/grade of the commodity found in India

Sunflower oil is a major vegetable oil in the world. It is used for a variety of cooking purposes. It is obtained from the Sunflower seed, which contains about 48 – 53 percent edible oil. The sunflower oil is considered as a premium when compared to other vegetable oils as it is light yellow in colour and have high level of linoleic acid, which is good for heart patients. It also possesses good flavour and high smoke point. Linoleic acid helps in washing out cholesterol deposition in the coronary arteries of the heart. The oil is also used for manufacturing hydrogenated oil. It is also used in the preparation of cosmetics and pharmaceuticals.

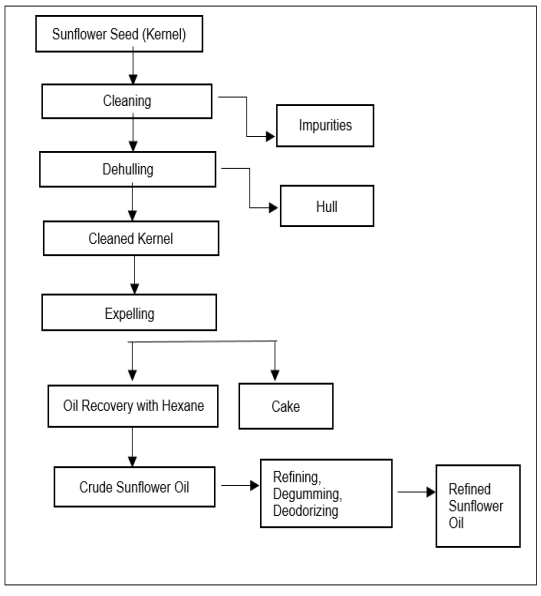
India is the third largest consumer of sunflower oil in the world after the EU and Russia. The annual average production, imports and consumption have remained around 0.60 lakh tonnes, 22.46 lakh tonnes and 23.52 lakh tonnes respectively based on five years' average data (2017-22). It means that India has a high dependency on imports to meet out its domestic consumption requirement.

Sunflower Oil in India is mainly imported from Ukraine, Russia and European Union. Based on last five years' data (2018-23), these three countries jointly account for around 95% share in total imports in to India with Ukraine having highest share i.e. around 70%. In India, sunflower seed cultivated at low piece of land over an area of 4.0 lakh ha with a production of 2.80 lakh tones (2022-23).

Process of Production/Extraction

A schematic diagram of sunflower seeds processing and oil extraction methods is as following.

Processing Process of Sunflower Oil



NCDEX Quality Parameters

Parameters	Specifications
Acid Value	4.0 (Max)
Refractive index at 40ºC	1.4640 - 1.4691
Butyro Refractometer reading at 40ºC	57.1 - 65.0
Saponification Value	188 - 194
Iodine value (Wij's method)	100-145
Flash Point (Pensky Marten Closed Cup Method)	Above 250ºC
Argemone Oil	Absent
Moisture & insoluble impurities (percentage by wt.)	0.5% Max

It shall be clear, free from rancidity, suspended or other foreign matter, separated water added coloring substance or mineral oil.
The contaminants, toxins and residues must not exceed the limits specified in FSSAI Regulations

Table: Reference Years for Commodities

Sl. No.	A	B	C
Crop Season	**Kharif**	**Kharif (Long Duration crop)**	**Rabi**
Crops	Paddy, Maize, Bajra, Guar seed, Kapas, Sesame Seed, Groundnut	Castor seed and Turmeric	Barley, Coriander, Jeera, Isabgol Seed
Relevant Processed commodities	Guar gum, Cotton, Cotton seed Oil cake, Gur, Crude Sunflower Oil	Castor Oil	-
Sowing Time	July onwards	July onwards	October onwards
Harvesting Time	Oct onwards	Jan onwards	March onwards
Reference Year Financial Year 2023-24 (Apr-Mar)			
Corresponding Years			
Production Year (PY)	2023-24 (July-Sept)	2022-23 (July-June)	2022-23 (July-June)
Marketing Year (MY)	2023-24 (Oct-Sept)	2023-24 (Jan/Feb-Dec/Jan)	2023-24 (Mar/Apr - Feb/Mar)
Calendar Year (CY)	2023 (Jan-Dec)	2023 (Jan-Dec)	2023 (Jan-Dec)
Relationship b/w Various Years	Current Financial Year = Current Production Year = Current Marketing Year = Calendar Year	Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year	Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year
Example	FY 2023-24= PY 2023-24= MY 2023-24= CY 2023	FY 2023-24= PY 2022-23 = MY 2023-24= CY 2023	FY 2023-24= PY 2022-23 = MY 2023-24= CY 2023

Note: Coffee is a plantation crop; hence, it is not classified under either Kharif or Rabi season in the above table.

Explanatory Notes:

- India is a vast country and various crops are sown and harvested at different point of time. However, two major crop seasons, are there i.e. Kharif & Rabi. Apart from it, Zaid/Summer season is also there.

- Crop seasons are classified based upon sowing time. Normally Kharif season sowing starts from mid-June/July and new crop arrivals begin from Oct/Nov. However, early/late sowing/harvesting also takes place. Rabi season sowing usually takes place mainly from October/November and harvesting starts from March/April. Early/late sowing/harvesting also takes place. Summer crops/Zaid crops are short duration crops mainly sown during January-March and harvested during April-June.

- "Production Year" is considered as "July to June". With the start of monsoon rains during June/July the sowing of Kharif season starts and they are harvested during Sept/Oct. From Oct onwards the sowing of Rabi season crops starts and harvesting usually takes place during March/April. Thus, a single production cycle completes between July-Sept period covering Kharif, Rabi and Zaid crops. Thus production year remains same for all season crops and the period corresponds to July-Sept.

- "Marketing Year" for each crops starts from beginning of the harvest time i.e. from start of new crop produce arrivals in the market. Thus, for Kharif crops Marketing Year is generally considered as "October to September", while for Rabi crops Marketing Year is considered as "April to March". However, Marketing Year may vary slightly for some of the crops depending upon early/late maturity/harvesting.

b. For processed commodities, their production starts after the start of new season crop arrivals of their underlying crop. Commodity fundamentals and balance sheet as per the following format (to be preparedbased on publicly available information on best effort basis):

Table - Fundamentals & Balance sheet (quantity)

(In Lakh Tonnes)

Global Scenario	Previous FY (2022-23)	Current FY (2023-24) (P)
Opening Stocks	25.79	29.58
Production	216.59	217.98
Imports	126.24	127.38
Total Supply	368.62	374.94
Exports	142.74	144.61
Domestic Consumption	196.30	206.51
Closing Stocks	29.58	23.82

Source: USDA (April 2024); P= Provisional,

(In Lakh Tonnes)

Indian Scenario	Previous FY (2022-23)	Current FY (2023-24) (P)
Beginning Stocks	2.30	5.80
Production	0.71	0.36
Imports	29.88	29.00
Total Supply	32.89	35.16
Exports	0.09	0.10
Domestic Consumption	27.00	29.00
Ending Stocks	5.80	6.06

Source: USDA (April 2024); P= Provisional,

(In Lakh Tonnes)

	Top 10 Major Producing Countries			Top 10 Major Consuming Countries		
Rank	Country	Previous FY (2022-23)	Current FY (2023-24) (P)	Country	Previous FY (2022-23)	Current FY (2023-24) (P)
1	Russia	64.84	68.15	European Union	52.13	54.13
2	Ukraine	60.20	63.22	India	27.00	29.00
3	European Union	40.14	38.87	Russia	24.25	25.25
4	Argentina	16.95	16.30	China	18.03	17.62
5	Turkey	10.64	8.27	Turkey	13.15	13.90
6	Kazakhstan	4.60	4.50	Iran	9.25	8.75
7	South Africa	2.82	2.72	Argentina	6.62	6.82
8	Serbia	2.22	2.38	Egypt	4.10	5.50
9	Moldova	2.50	2.29	Iraq	5.00	5.50
10	China	2.51	2.15	Ukraine	4.05	4.20
	Others	9.17	9.13	Others	32.72	35.84
	World Total	216.59	217.98	World Total	196.30	206.51

Source: USDA (April 2024), P= Provisional,
Countries are arranged in descending order based on the figure in Current FY 2023-24 (P)

(In Lakh Tonnes)

Rank	Top 10 Major Exporting Countries			Top 10 Major Importing Countries		
	Country	Previous FY (2022-23)	Current FY (2023-24) (P)	Country	Previous (2022-23)	Current FY (2023-24) (P)
1	Ukraine	56.83	59.00	India	29.88	29.00
2	Russia	40.00	44.00	European Union	21.03	24.50
3	Turkey	11.02	11.00	China	15.55	15.50
4	Argentina	10.50	10.00	Turkey	17.11	12.25
5	European Union	12.21	9.00	Iran	8.00	8.00
6	Kazakhstan	3.14	2.90	Egypt	4.00	6.00
7	Moldova	2.29	2.00	Iraq	6.00	5.75
8	Serbia	1.40	1.55	United Kingdom	1.99	2.80
9	Bolivia	1.35	1.30	Uzbekistan	2.93	2.75
10	Belarus	0.50	0.80	South Africa	2.10	1.80
	Others	3.50	3.06	Others	17.65	19.03
	World Total	142.74	144.61	World Total	126.24	127.38

Source: USDA (April 2024), P= Provisional,

(In Lakh Tonnes)

Top 10 Major producing states in India			
Rank	States	Previous FY	Current FY

It is a processed commodity. Further, more than 95% of the India's supply is met through imports. Thus, no such categorization is applicable for this commodity.

c. Major changes in the polices governing trade in the spot markets of the commodity

Date	**Major Policies governing trade and related changes**
26-Apr-23	Indonesian Senior trade ministry said that Indonesia to lower palm oil domestic obligation to 300,000 tonnes from 4,50,000 tonnes per month from 1st May, 2023.
10-May-23	The Central Government under notification No.37/2023- Customs waives duty and agri cess on crude soya bean, sunflower oil imports under tariff rate quota till June 30, 2023.
14-Jun-23	The Central Government lowered import duty on Refined Soy Oil and Refined Sunflower Oil to 12.5% from 17.5% w.e.f June 15, 2023.
02-Nov-23	Indonesia, the largest global palm oil producer, decided to extend its domestic market obligation (DMO) for palm oil until 2024 as part of its strategy to stabilize the prices of cooking oil. This policy, initiated last year, was put in place to curb the steep increase in cooking oil prices. Under this system, palm oil producers can only export their products after a portion of their production is sold within the domestic market.
04-Jan-24	In operational data for December 2023/24 MY, Ukraine recorded a significant surge in sunflower oil exports, reaching approximately 672,000 tonnes. This marked a 25% increase compared to November and marked the highest monthly shipment volume since January 2022. Notably, this figure stands as the second-highest ever recorded for December in the entire history of Ukraine's sunflower oil exports.

d. Geo political issues in the commodity and its impact on Indian scenario.

Date	Event	Key Details	Key Implications/Impact
22-Jul-2023	Russia ends Black Sea grain deal	**Sunflower oil prices up as Russia ends Black Sea grain deal:** Shipments of sunflower oil to India have stopped after Russia on July 17 said it was pulling out of the year-old deal that allowed shipments of grains and other foodstuffs to move past the Russian naval blockade in the Black Sea.	• Prices of sunflower oil increased in India after Russia suspended a deal that allowed export of commodities from war-torn Ukraine through the Black Sea.
14-Dec-2023	Houthi attacks on ships in the Red Sea affected global trade	Houthi rebels intensified attacks on Red Sea vessels amid Israel-Hamas conflict, prompting concerns over global trade disruption. Targeting Israeli-linked ships, attacks expanded with a strike on a Norwegian-flagged oil tanker and missiles fired at a vessel near the Suez Canal. The Houthis' actions threaten a vital trade artery.	• Trade disruption in international market to impact supplies in the domestic market.

2. Trading related parameter

a. Monthly and Annual traded volume (quantity in appropriate units)

Month	Year	Symbol	Traded volume (MT)
Nov	2023	SUNOIL	8,650
Dec	2023	SUNOIL	9,090
Jan	2024	SUNOIL	10,710
Feb	2024	SUNOIL	9,135
Mar	2024	SUNOIL	6,320
Annual Traded Volume (MT) (April'23 to March'24)			**43,905**

b. Annual traded volume as proportion of total deliverable supply (quantity in appropriate units)

Symbol	Traded Volume (MT)	Deliverable Supply(MT)	Proportion
SUNOIL	43,905.00	3,516,000	0.01

c. Annual traded volume as proportion of total annual production (quantity in appropriate units)

Symbol	Traded volume (MT)	Production(MT)	Proportion
SUNOIL	43,905	36,000	1.22

d. Annual average Open interest as proportion of total production

Symbol	Average Open Interest (MT)	Production(MT)	Proportion
SUNOIL	2,594.95	36,000	0.07

e. Annual average Open interest as proportion of total deliverable supply

Symbol	Average Open Interest (MT)	Deliverable supply(MT)	Proportion
SUNOIL	2,594.95	3,516,000	0.00

f. Monthly and Annual value of trade (in Rs. Crores)

Month	Year	Symbol	Traded value (in Rs. Crores)
Nov	2023	SUNOIL	77.87
Dec	2023	SUNOIL	77.43
Jan	2024	SUNOIL	90.67
Feb	2024	SUNOIL	76.78
Mar	2024	SUNOIL	54.86
Annual Traded Volume (in Rs Crores) (April'23 to March'24)			**377.61**

g. Monthly and Annual quantity of delivery (in appropriate units)

NA

h. Monthly and Annual value of delivery (in Rs. Crores)

NA

i. Monthly and Annual Average Open Interest (OI) (in appropriate units)

Month	Year	Symbol	Average Open Interest (MT)
Nov	2023	SUNOIL	1,716.15
Dec	2023	SUNOIL	2,924.50
Jan	2024	SUNOIL	3,929.52
Feb	2024	SUNOIL	2,342.62
Mar	2024	SUNOIL	1,456.67
Annual Average OI (MT) (April'23 to March'24)			**2,567.04**

j. Annual average volume to open interest ratio

18.39%

k. Total number of unique members and clients who have traded during the financial year

Symbol	Member Count	Client Count
SUNOIL	74	270

l. Ratio of open interest by FPOs/farmers/Hedge/VCP positions to total open interest (Annual average as well as maximum daily value)

Annual Average	0.44%
Maximum Daily Value	1.00%

m. Number of unique FPOs / farmers and VCPs/hedgers who traded in the financial year

Commodity	Count
SUNOIL	5

Commodity wise client categorization is as per category details as provided by the members.

n. Algorithmic trading as percentage of total trading

Commodity	%
SUNOIL	0.80%

o. Delivery defaults

NA

3. Price Movements

a. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international futures price (wherever relevant comparable are available).

NA

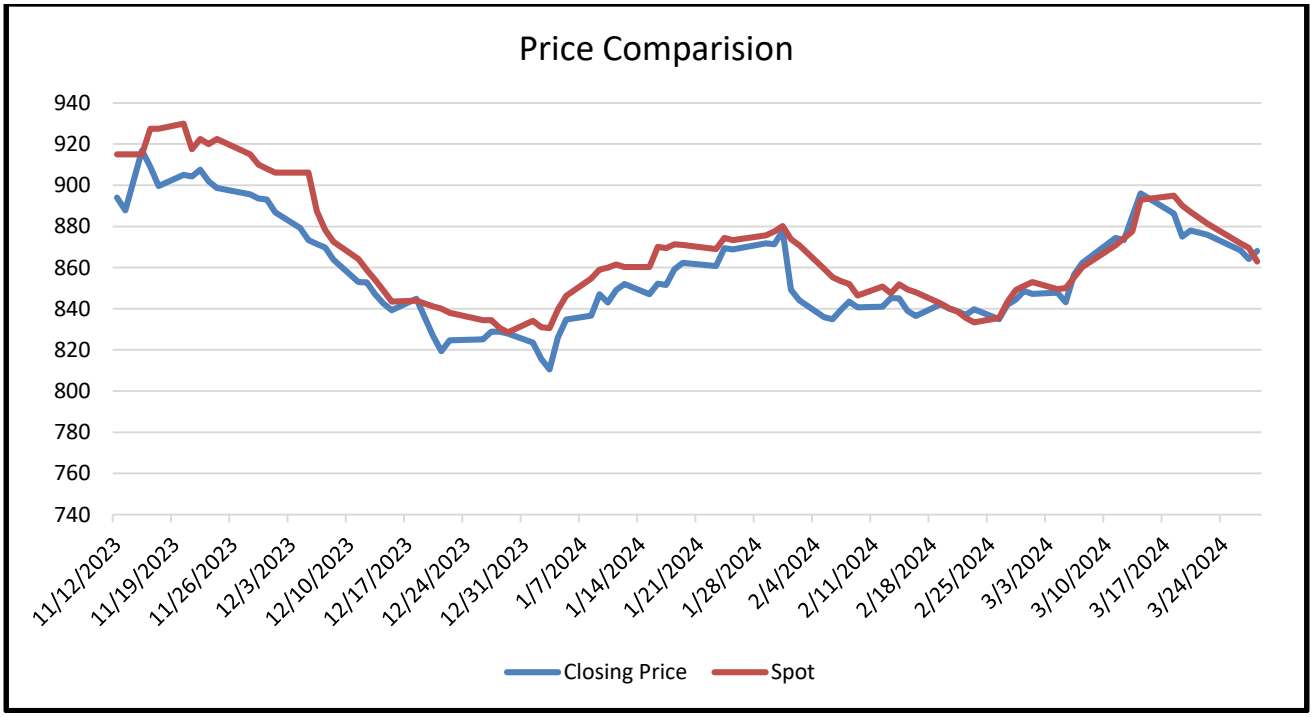
b. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international spot price (wherever relevant comparable are available) and domestic spot price (exchange polled price).

NA

c. Correlation between exchange futures & domestic spot prices along with ratio of standard deviation.

Correlation			
	Futures	*Spot*	*Mandi*
Futures	1		-
Spot	0.956453	1	-
Mandi	-	-	-

Standard Deviation			
	Futures	*Spot*	*Mandi*
Futures	1	0.646381	-
Spot	1.547075	1	-
Mandi	-	-	-



d. Correlation between international futures & international spot prices along with ratio of standard deviation (wherever relevant comparable are available).

NA

e. Comparison of Exchange polled price and mandi price (in case of agricultural commodities) /other relevant price (in case non-agricultural commodities) at basis centre.

As Crude Sunflower Oil is a processed commodity mandi prices for the same are not available

f. Maximum & Minimum value of daily futures price volatility and spot price volatility along withdisclosure of methodology adopted for computing the volatility. (Volatility calculated by Squareroot of Standard Deviation of daily returns for the period from 1 April 2022 to 31 March 2023)

Value of daily futures price volatility (April 2022- March 2023)

Volatility	Month	Value
Max	Nov	0.0180
Min	Feb	0.0052

Value of daily Spot price volatility (April 2022- March 2023)

Volatility	Month	Value
Max	Aug	16.649
Min	Feb	0.005

g. Number of times the futures contract was in backwardation/ contango by more than 4% forthe near month contract in the period under review

Contango	0
Backwardation	0

4. Others parameters

a. Qualitative and quantitative measure for Hedge effectiveness ratio and basis Risk (Volatility of Basis) along with disclosure of methodology adopted for such calculations

	SUNOIL
Basis Volatility	2.656
Hedge efficiency	57.80%

The methodology for hedge efficiency ratio calculation is appended as Annexure 1

b. Details about major physical markets of the commodity vis-à-vis market reach in terms ofavailability of delivery centers (information to be provided state-wise and UT-wise).

State	Major Physical Markets	Availability of NCDEX Delivery center
Tamil Nadu	Chennai	Chennai (It is cash settled contract)
	Erode	
	Salem	
	virudhunagar	
Karnataka	Srirangapatna	
	Mangluru	
Andhra Pradesh	krishnapatnam	
Telangana	Hyderabad	
Madhya Pradesh	Indore	
Maharashtra	Mumbai	
	Nagpur	

	Akola	
Gujrat	Ahmedabad	
	Kandla	
	Rajkot	
Rajasthan	Jaipur	
Uttar Pradesh	Kanpur	

c. Details about major physical markets of the commodity and average Open Interest for each month generated from those regions.

Note – The OI for each month is classified based on the Member level. The Average OI is on gross level (Long OI + Short OI)

Month	Maharashtra	Gujarat	Tamil Nadu	Madhya Pradesh	Haryana
Apr-23	-	-	-	-	-
May-23	-	-	-	-	-
Jun-23	-	-	-	-	-
Jul-23	-	-	-	-	-
Aug-23	-	-	-	-	-
Sep-23	-	-	-	-	-
Oct-23	-	-	-	-	-
Nov-23	480	416	255	538	162
Dec-23	603	2,573	117	880	238
Jan-24	1,257	2,911	1,161	750	557
Feb-24	1,607	733	344	960	63
Mar-24	930	410	118	259	190

***Note** - The OI for Custodian Participation is not mapped to any State/ location and hence not consideredin the above data.*

d. Details, such as number and target audience, of stakeholders' awareness programs carried out by the exchange.

Following list of Awareness programme, Stakeholder engagement programme has conducted for FY2023-24.

Sr. No.	Programme	Location	No. of Participants
1	IEP	Kochi	54
2	IEP	Patna	48
3	IEP	Purnia	33
4	IEP	Kavardha, Raipur, CG	70
5	IEP	Kolkata	40
6	IEP	Delhi	73
7	IEP	Mehsana, Gujarat	31
8	IEP	Rajkot	45
9	IEP	Delhi	30
10	IEP	Durgapur	40
11	IEP	Bhopal	40
12	IEP	Deesa	50
13	IEP	Indore	32
14	IEP	Durgapur	42
15	IEP	Indore	40
16	IEP	Varanasi	50
17	IEP	Ahmedabad	25

Sr. No.	Programme	Location	No. of Participants
18	IEP	Sriganganagar	60
19	IEP	Lucknow	40
20	IEP	Sirsa	35
21	IEP	Delhi	35
22	IEP	Indore	30
23	IEP	Raigarh	38
24	IEP	Kavardha, Raipur	35
25	IEP	Ratlam	26
26	IEP	Kolkata	94
27	IEP	Ratlam	36
28	IEP	Neemuch	40
29	IEP	Indore	42
30	IEP	Rajkot	37
31	IEP	Chennai	40
32	IEP	Agra	40
33	IEP	Delhi	41

e. Steps taken / to be undertaken to improve hedging effectiveness of the contracts as well asto improve the performance of illiquid contracts.

1. Identifying new value chain participants in the in the region of Lunkarsar, Khajuwala and Hissar.
2. Conducted awareness programs at Sirsa and Hissar in Haryana.
3. One on one meeting with market participants and hedgers.

5. Any other information to be disclosed as deemed important by the exchange or as suggested by the PAC

N.A

ANNEXURE I

Qualitative and quantitative measure for Hedge effectiveness ratio

Methodology

Regression analysis is carried out between near month futures returns and NCDEX polled spot prices returns of the FY 2023-24.

The R-Square value of the Regression analysis represents the "**HedgingEfficiency"**.

Note: -

Date for which spot prices were not available is not used for analysis.

Weekly returns are used for performing Regression Analysis.

The method used to calculate Hedging Efficiency does not consider liquidity risk because of thisreason illiquid commodities can have high hedging efficiency.

References:

Ghosh, Ph.D, Nilanjan & Dey, Debojyoti & Moulvi, Nazir & Jain, Niteen & Sinha, Neha & Rachuri, Sarika. (2013). Hedging Efficiency—Measures and Empirical Study.