Palm Oil Seminar Series

Hilton Miami Airport

November 14, 2014

Development in the Global Palm Oil Sector

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- About MPOB
- Introduction to Palm Oil
- Palm Oil in the U.S.
- Palm Oil in Global Trade
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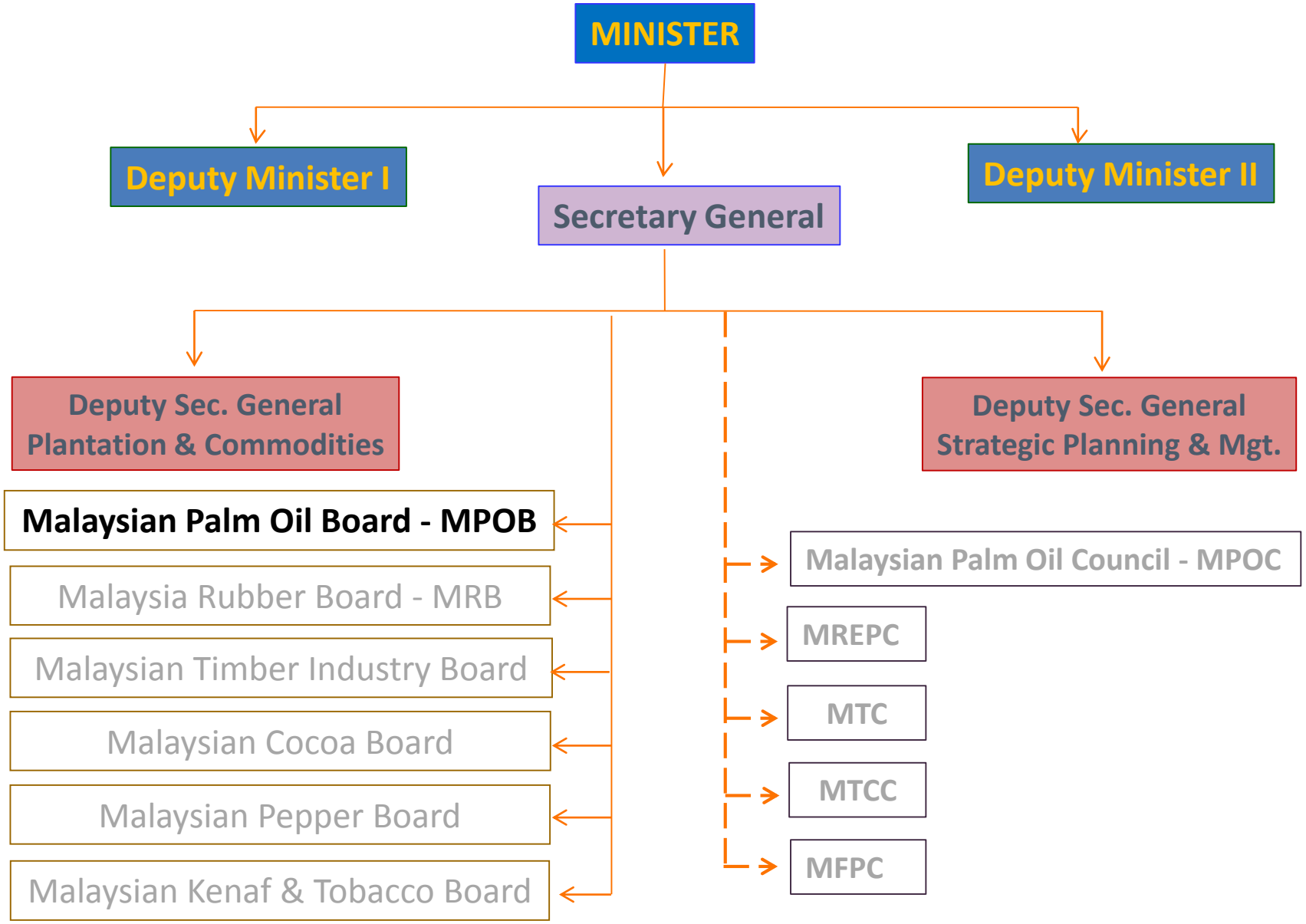
Ministry of Plantation Industries and Commodities - Structure



MPOB MAIN FUNCTIONS

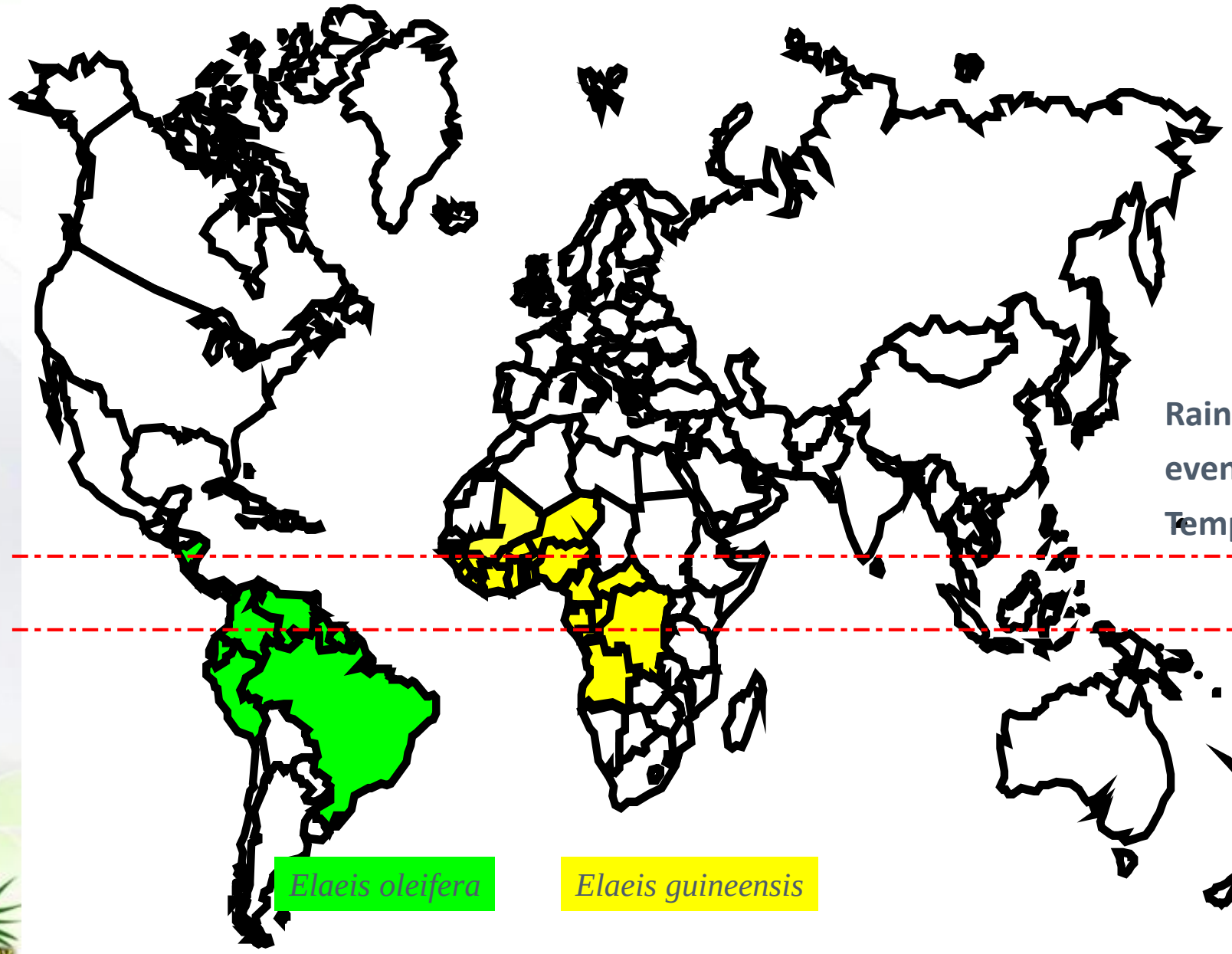
- Implement Policies and Development Programmes for Viability of Oil Palm Industry
- Conduct and Promote Research and Development (R&D)
- Regulate, Register and Promotes All Activities related to Oil Palm Industry
- Provide Consultancy and Advisory Services
- Commercialization of Research Findings
- Develop Training Programme
- Resource and Information Centre


Brussels
Washington DC
Cairo
Karachi
Shanghai
Mumbai
Kuala Lumpur

ADVISORY SERVICES OFFICES

- Technical Support
- General Advisory Services
- Product Technology Transfer
- Training – POFP, Seminars, Etc
- Consultancy
- Trouble Shooting

ORIGIN OF OIL PALM



Rainfall: 1500-2000 mm/year, evenly distributed

Temperature: min 22-24°C max 29-33°C

Sunshine: continuous 5 hours/day

Soil: loose-textured, no hard layer

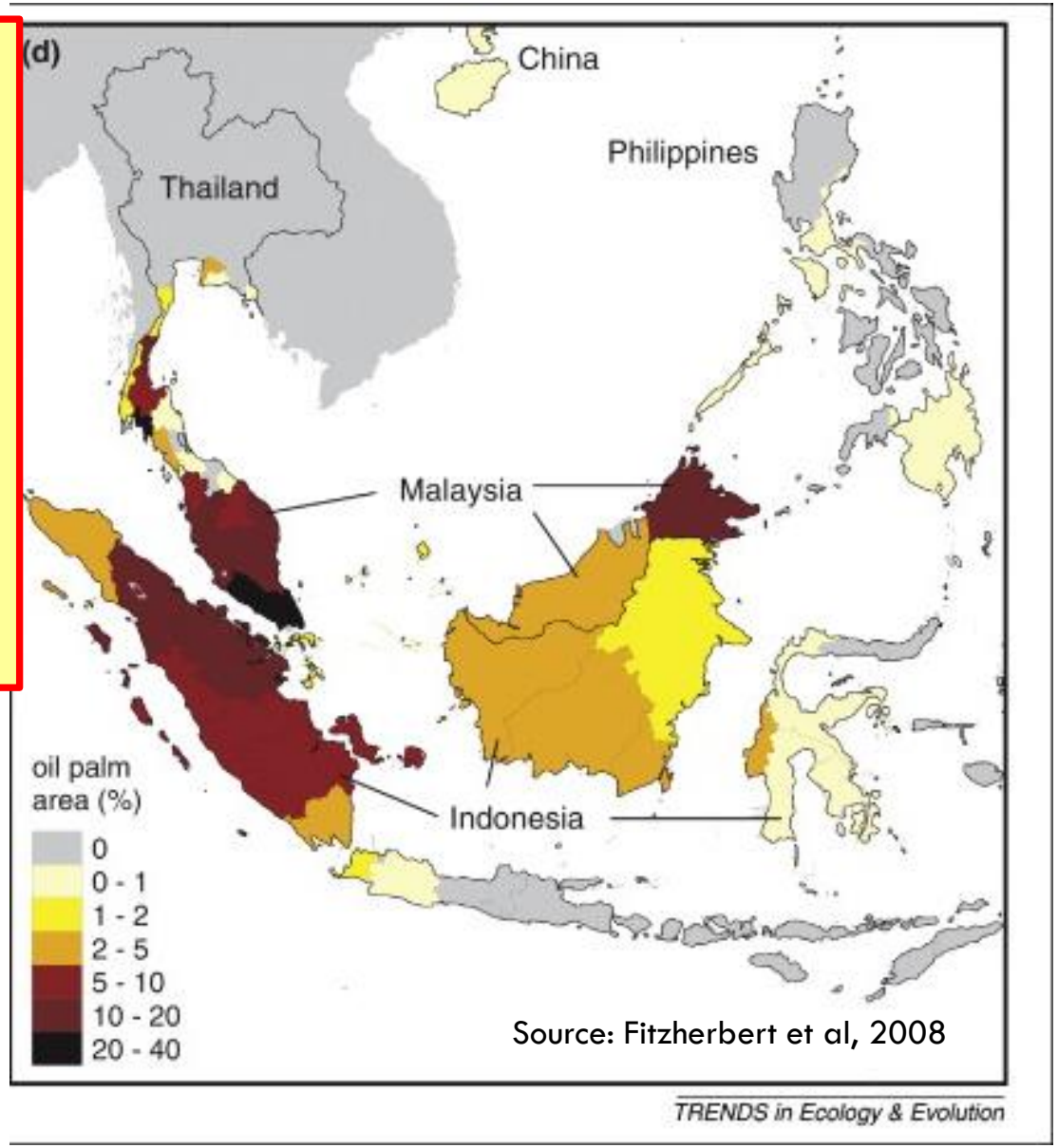
DISTRIBUTION OF OIL PALM PLANTED AREAS IN SOUTH EAST ASIS (SEA)

Oil Palm Mature Area (World) = 14.847 mil ha

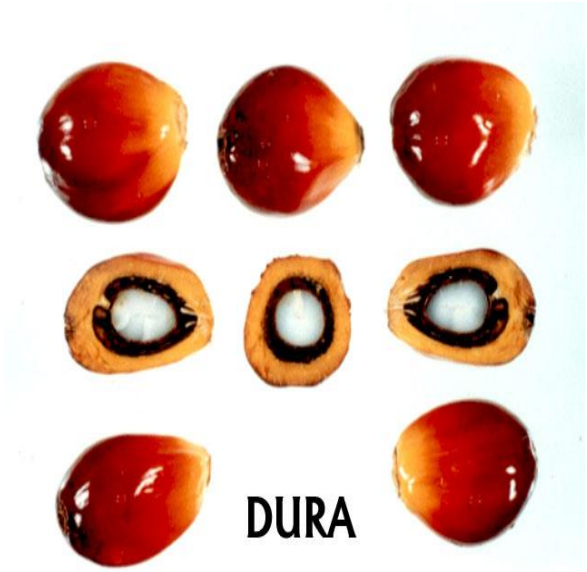
Oil Palm Mature Area (SEA) = 12.030 mil ha

(81% of world mature area)

Source: Oil World Annual 2013



Elaeis guineensis



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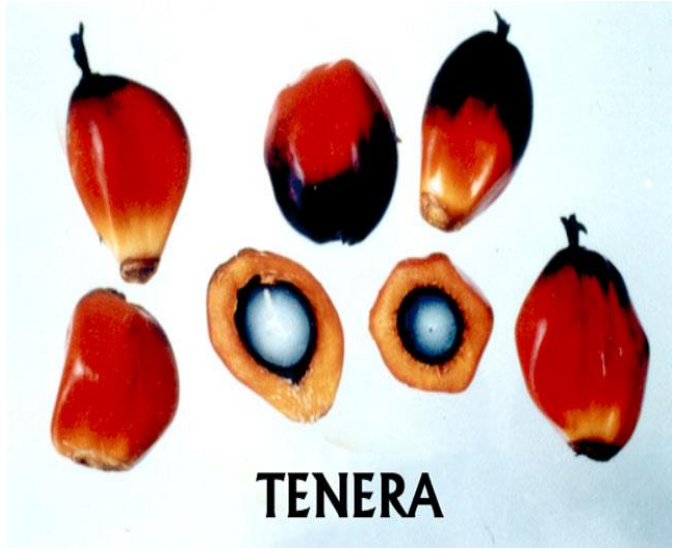


ELAEIS GUINEENSIS

- Species: *Elaeis guineensis*
- Type: Tenera (DXP)
- Planting density: 148 palm/ha
- Nursery period: 24 months
- Economic Life: 25 years
- Palm Height: 2.3 meters
- Harvesting interval: 15 days
- No. of bunches/yr: 19

ELAEIS GUINEENSIS

- Bunch weight: 10-15 kg
- Fruitlets/bunch: 1000-3000
- Oil/bunch: 22-25%
- Kernel/bunch: 4%
- Kernel production/year: 8kg
- Oil production/year: 42.5 kg

ELAEIS GUINEENSIS

- **Fruit shape: Oval**
- **Fruit size: 5 cm**
- **Fruit weight: 10 g**
- **Mesocarp/fruit: 83%**
- **Oil/dry mesocarp: 75%**
- **Kernel/fruit: 7%**

OIL PALM FRUIT

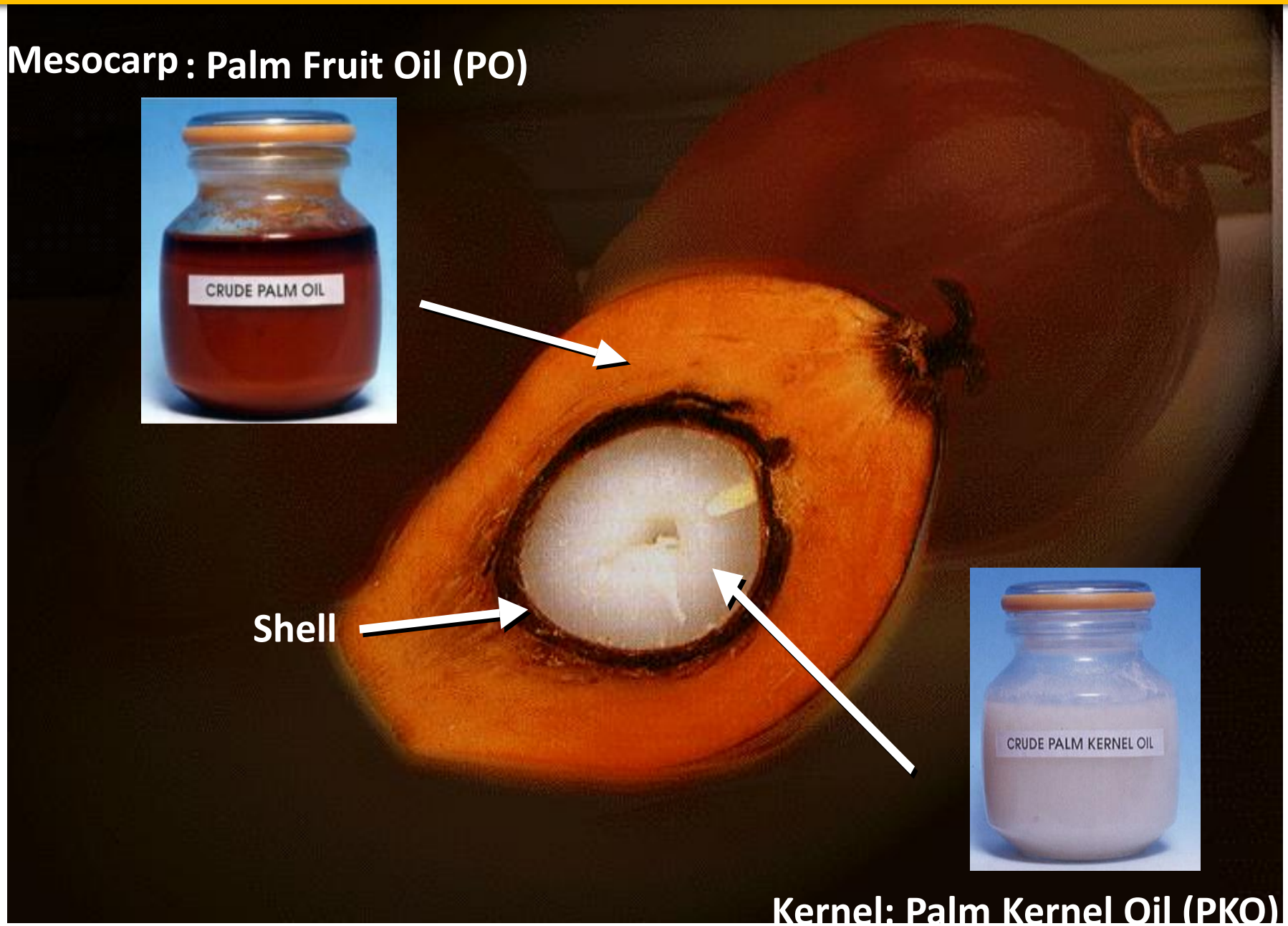
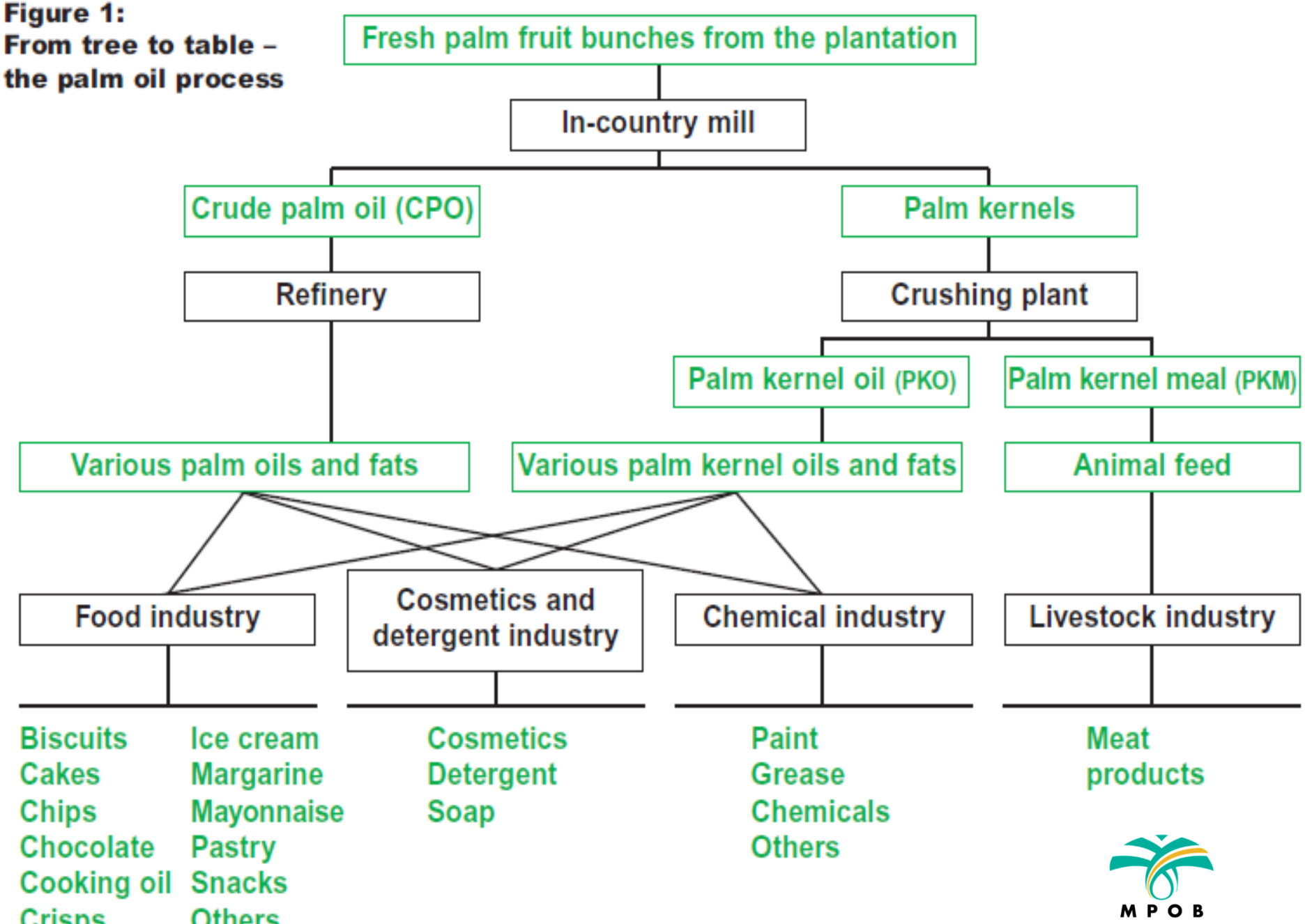
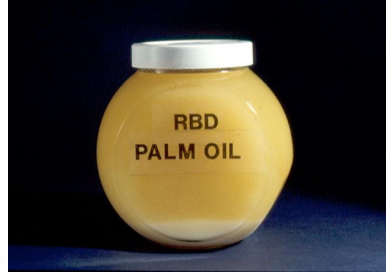


Figure 1:
From tree to table – the palm oil process



MPOB

RBD Palmoil
IV 52-53 M.Pt. 37-38 °C
(Sat. fatty acids) S.F.A. 49-50%



Palm Olein
IV 56-57 C.Pt. 7-10 °C
S.F.A. 45%
Fluid frying oil

Palm Stearin
IV 32-35 M.Pt. 52-54 °C

Soft Stearin
IV 40-42 M.Pt. 47-49 °C
Margarine base stock

Super Stearin
IV 10-20 M.Pt. 58-61 °C
Substitute to hydrogenated fats in margarine

Super Olein
IV 64-65 C.Pt. 3-4 °C
S.F.A. 37%
Liquid oil blend with soya

Palm Mid Fraction
IV 42-48 M.Pt. 27-31 °C
Margarine base stock

Top Olein
IV 70-72 C.Pt. -2 °C
S.F.A. 30%
24 hours at 0°C

Olein like Fraction
IV 56 C.Pt. 10 °C
Margarine base stock

Hard Palm Mid Fraction
IV 32-36 M.Pt. 33-3 °C
Base stock for Cocoa Butter equivalent (CBE)

MALAYSIA: RANGE OF PALM OIL PRODUCTS EXPORTED

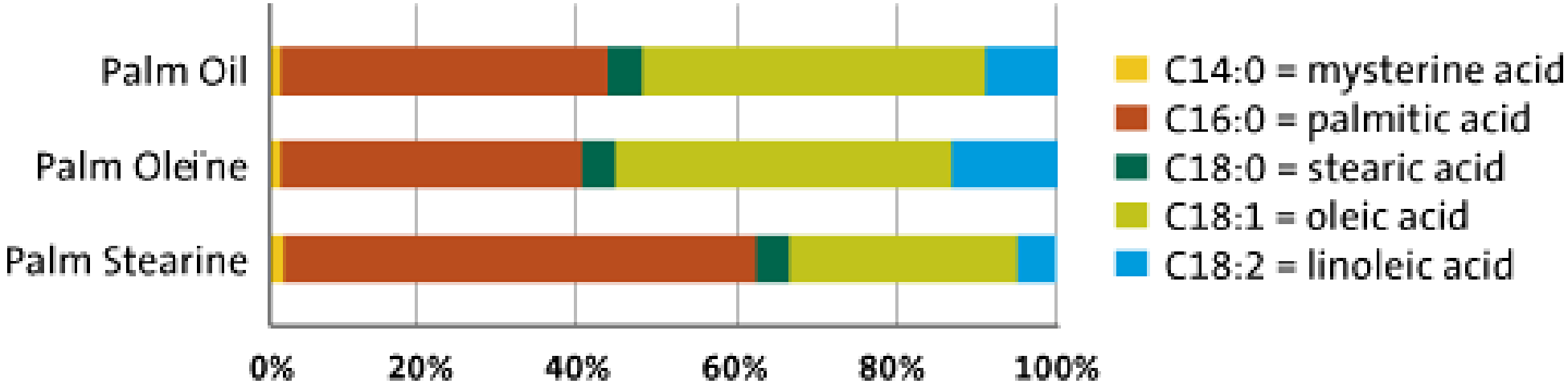
Palm Oil Products	Palm Kernel Oil Products	Oleochemicals
Crude Palm Oil	Crude Palm Kernel Oil	Oleic Acid
Crude Palm Olein	Crude Palm Kernel Stearin	Palmitic Acids
Crude Palm Stearin	RBD Palm Kernel Oil	Glycerine
Neutralised Palm Oil	RBD Palm Kernel Olein	Lauric Acid
Neutralised Palm Olein	RBDH Palm Kernel Oil	Stearic Acid
Bleached Palm Oil	RBDH Palm Kernel Olein	Palm Kernel Methylester
NB Palm Olein	RBDH Palm Kernel Stearin	Caprylic-Capric Acid
NB Palm Oil	NBDH Palm Kernel Oil	Split Palm Stearin Fatty Acid
NBD Palm Oil	NBDH Palm Kernel Olein	Methylester
RBD Palm Oil	NBDH Palm Kernel Stearin	Methylester Residue
NBD Palm Stearin	NBD Palm Kernel Olein	Myristic Acid
RBD Palm Olein	NBD Palm Kernel Stearin	Triple Stearic Acid
Palm Acid Oil	NB Palm Kernel Olein	Fatty Acid
Palm Fatty Acid Distillate	NB Palm Kernel Stearin	Caprylic Capric Acid B
Cooking Oil/Double Olein	NBH Palm Kernel Olein	Palm Stearin Fatty Acid
RBD Hydrogenated Palm Oil	NBH Palm Kernel Stearin	Split Palm Fatty Acid
RBD Hydrogenated Palm Olein	Palm Kernel Fatty Acid	Distillate PKO Fatty Acid
Hydrogenated Palm Olein	Palm Kernel Acid Oil	Split Palm Kernel Fatty Acid
RBD Hydrogenated Palm Olein	Hydrogenated Palm Kernel Oil	Fatty Acid Methylester
Hydrogenated Palm Olein	Hydrogenated Palm Kernel Olien	Residue
RBD Hydrogenated Palm Stearin	Hydrogenated Palm Kernel Stearin	Lauric Fat
Hydrogenated Palm Stearin	Hydrogenated Palm Kernel Fatty Acid	Palm Fatty Acid Residue
Hydrogenated Palm Oil	Neutralised Palm Kernel Stearin	Hydrogenated Stearin Fatty Acid
RBD Hydrogenated Stearin Flake	Bleached Palm Kernel Stearin	Split Hydrogenated Stearin
Refined Palm Oil		Fatty Alcohol
Hydrogenated Palm Fatty Acid Distillate		Split Hydrogenated Palm Fatty Acid
Finished Products	Cocoa-Butter Substitute	Soap
Vegetable. Ghee/Vanaspati	Cocoa-Butter Extenders	Soap Stocks
Margarine	Palm Mid-Fraction	Dough Fats
Shortening	Fat Blend	Soap Noodles

PALM OIL APPLICATIONS

Wide range of applications :

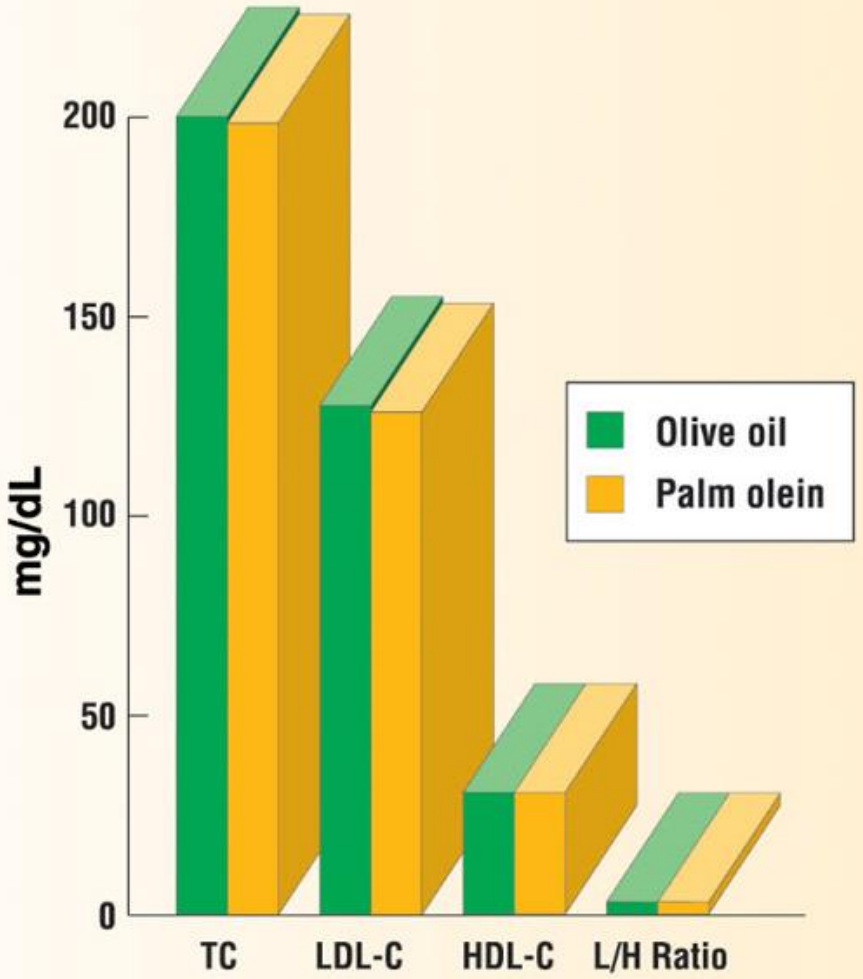
- Spreads
- Margarines
- Baking fat
- Frying fat
- Cooking oil
- Confectionery fat

FATTY ACID COMPOSITION OF PALM OIL AND FRACTIONS

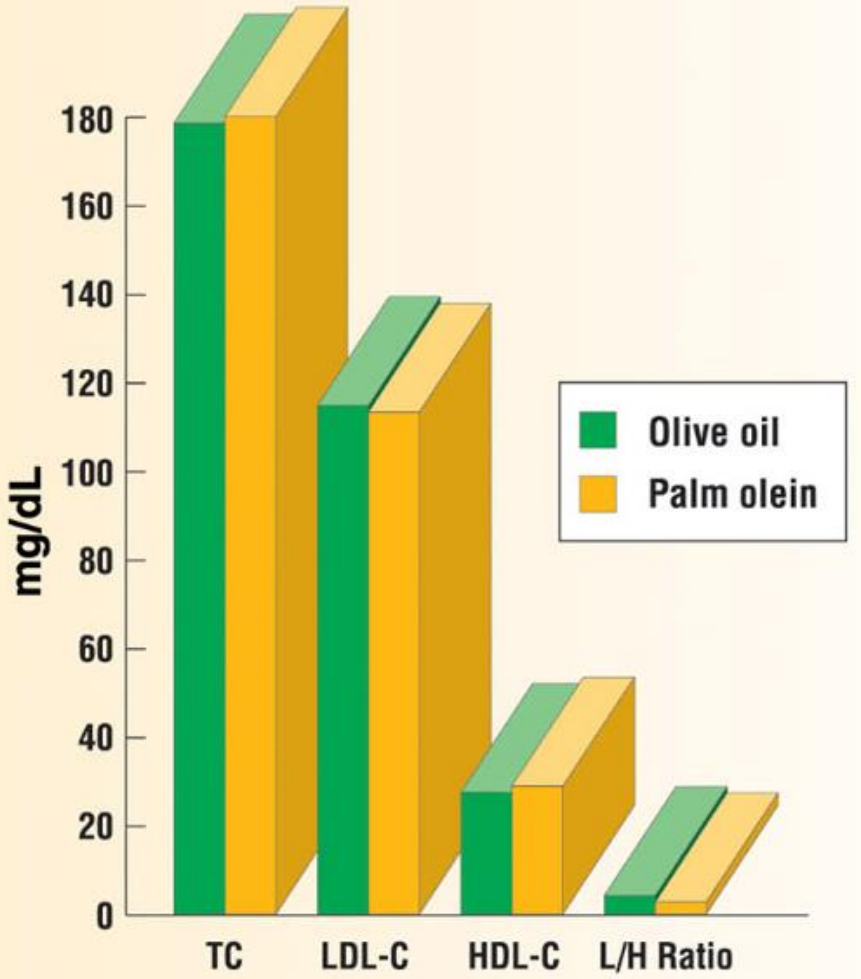


Fatty Acid	Palm Oil	Std. Palm Olein	Special Palm Olein	Palm Stearin
C14:0	1.1	1.0	1.1	1.3
C16:0	44.4	39.8	31.5	54.0
C18:0	4.5	4.4	3.2	4.7
C18:1	39.2	42.5	49.2	32.3
C18:2	10.1	11.2	13.7	7.0
C18:3	0.4	0.4	0.3	0.1
Iodine Value	53	58	66.4	39.9
Melting Pt. (°C)	36	21.6	12.0	51.3
Could Point (°C)	-	8.8	2.2	-

CHOLESTEROL-MODULATING EFFECTS OF PALM OLEIN AND OLIVE OIL ARE COMPARABLE

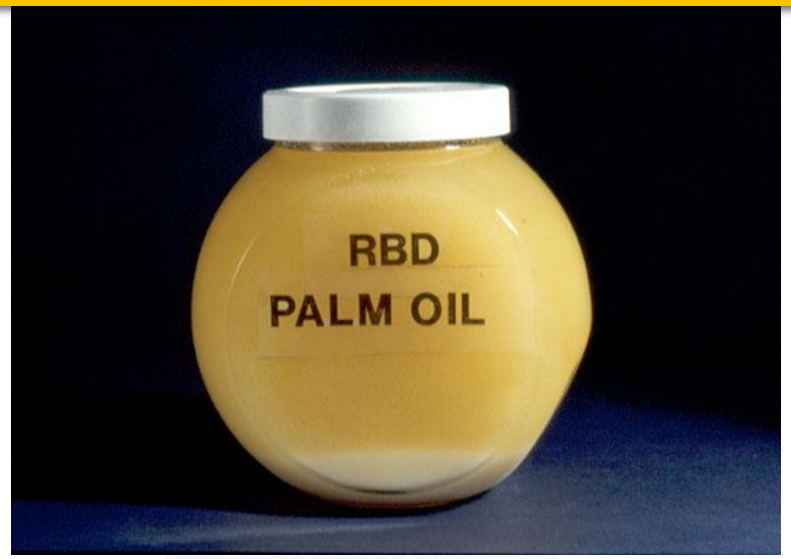


Ref: Ng et al. (1992). J Am Coll Nutr. 11:383-90.



Ref: Choudhury et al. (1995). J Am Clin Nutr. 61:1043-51.

REFINING OF PALM OIL

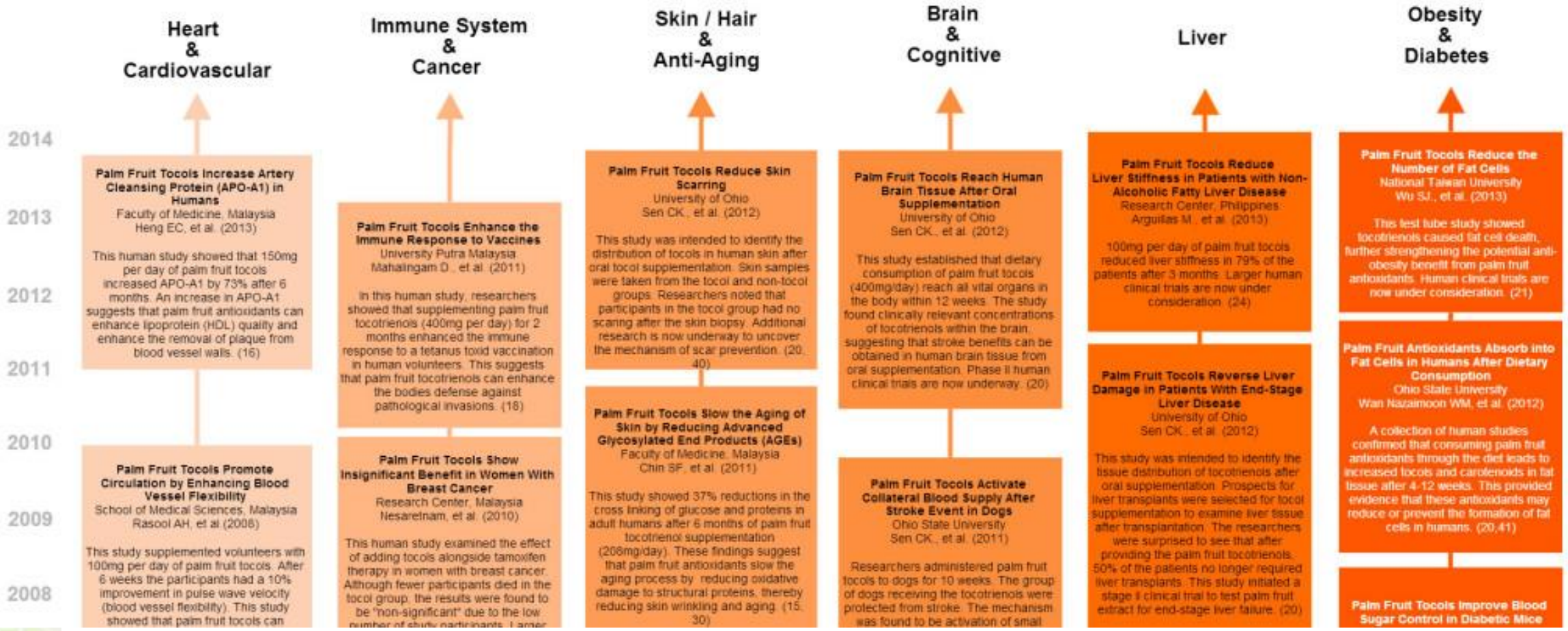


RED PALM OIL / OLEIN

- Palm olein with high amounts of **β-carotenes**
- **Deep reddish colour** cooking oil
- **Widely accepted in Japan** for healthful benefits

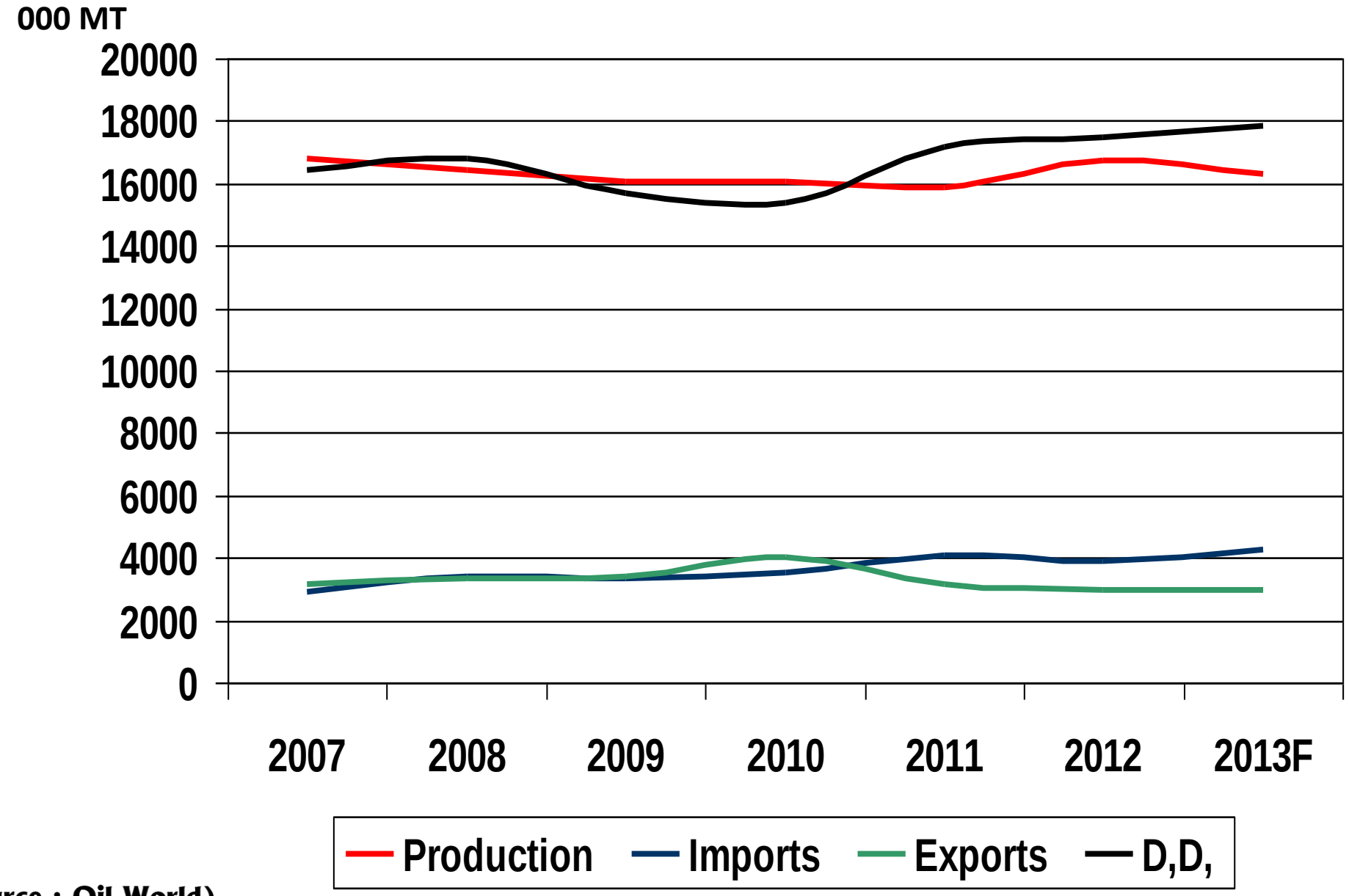
Health Science of Palm Fruit Antioxidants : The 30 Year Research Timeline

Fat Soluble Antioxidants of The Oil Palm: Tocols & Carotenoids



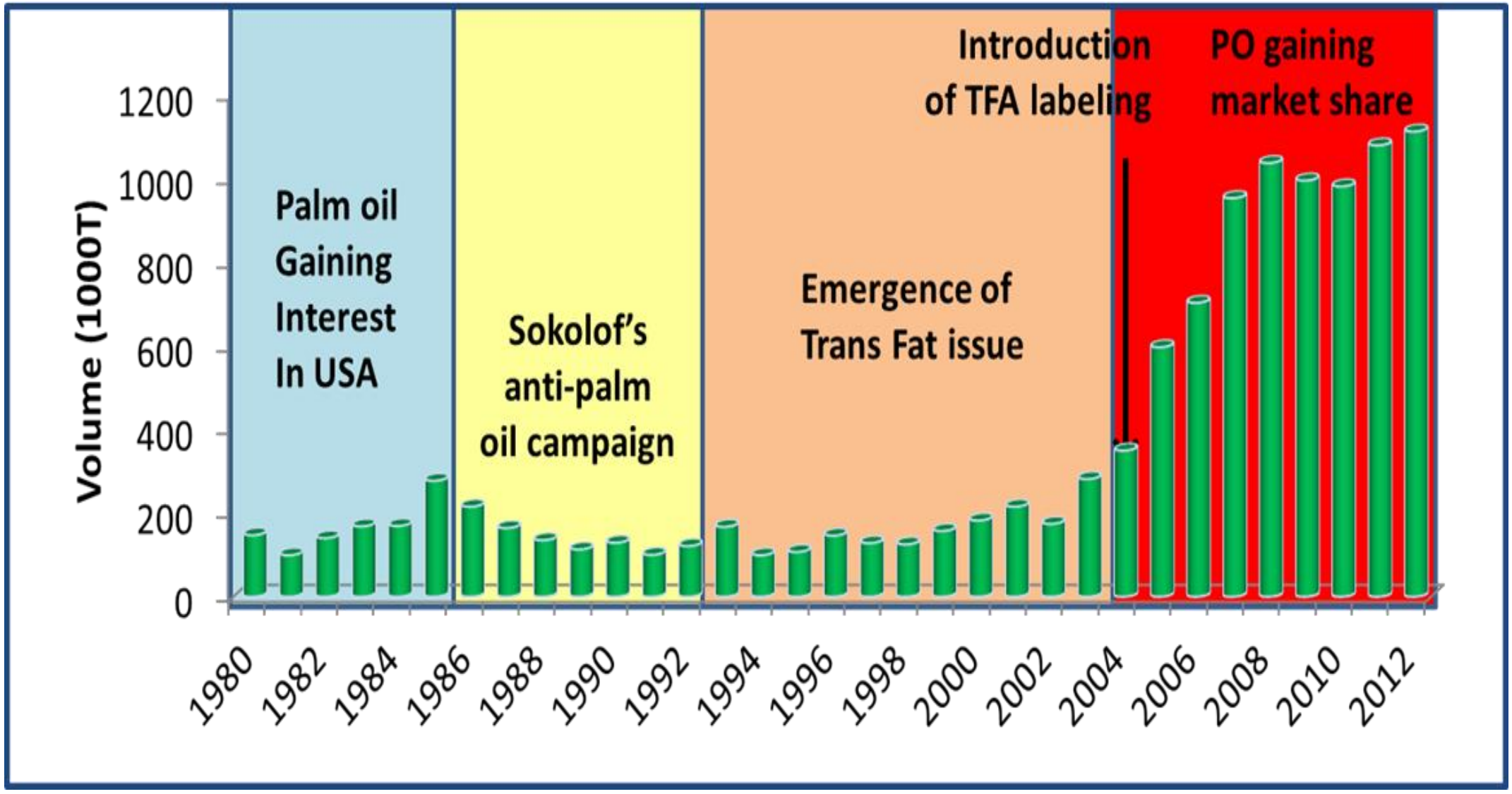
Source: https://blog.botanicalcraft.com

USA: Oils and Fats Balance (000 MT)

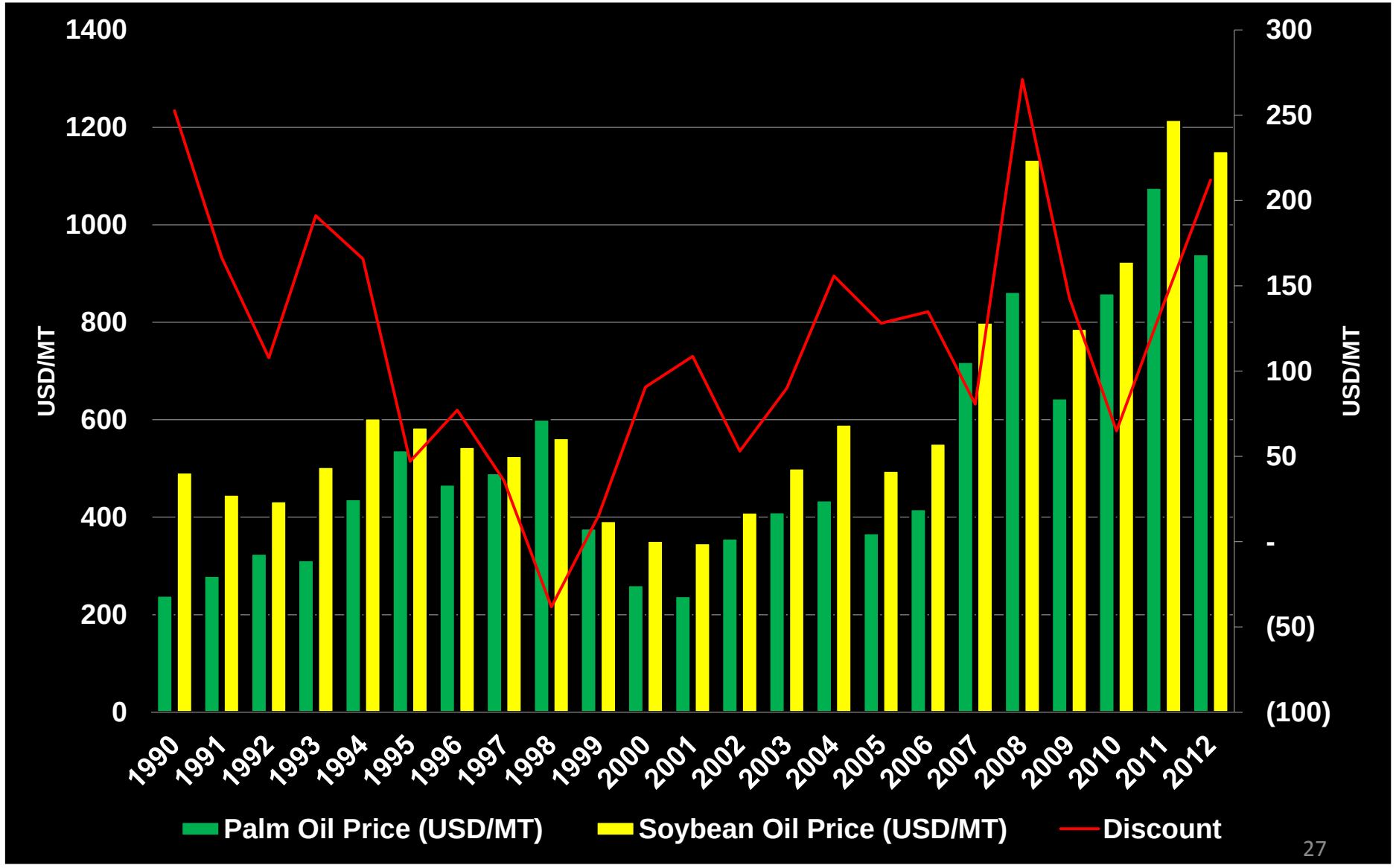


(Source : Oil World)

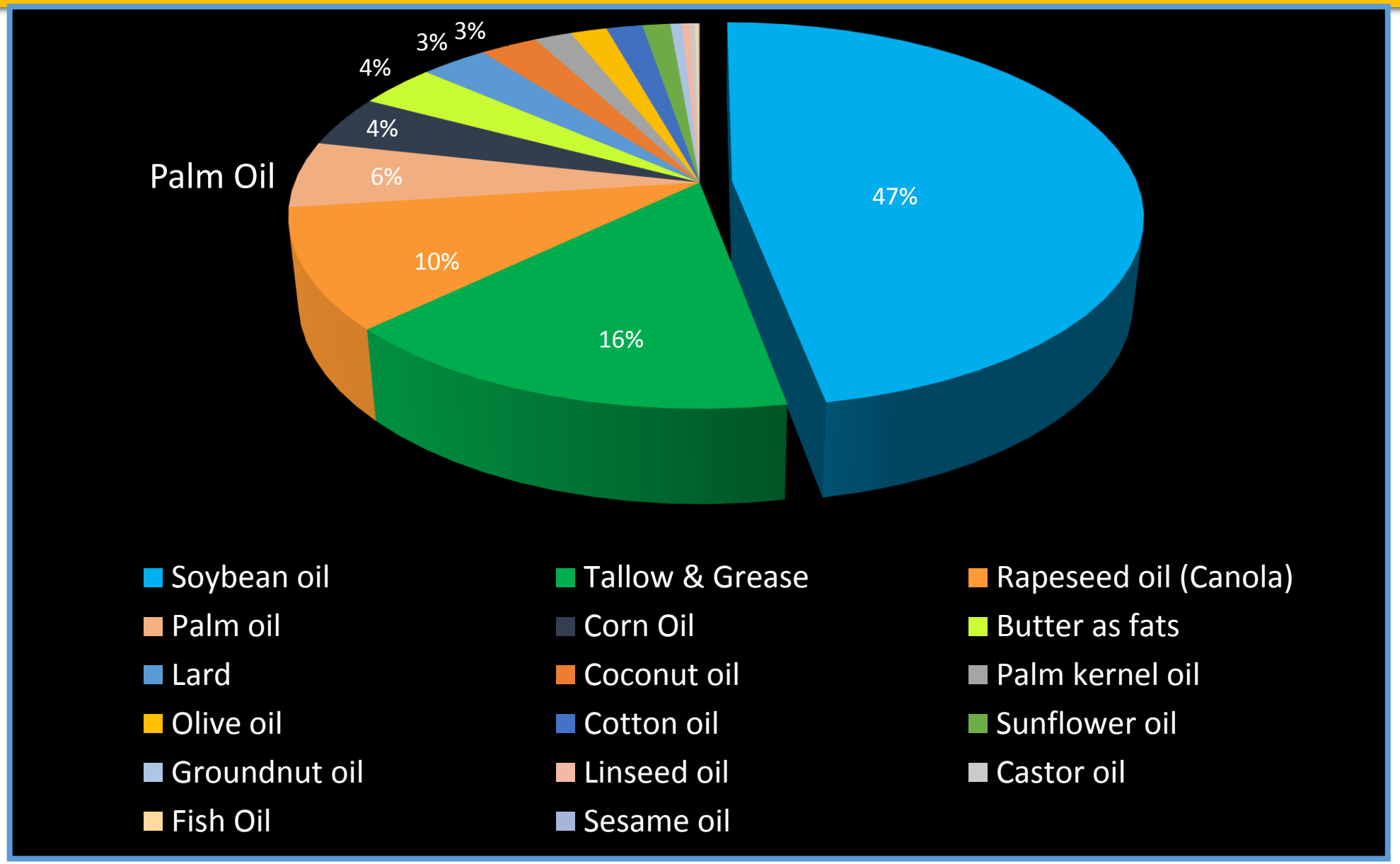
Oils & Fats: Palm Oil Imports



Palm Oil vs Soybean Oil

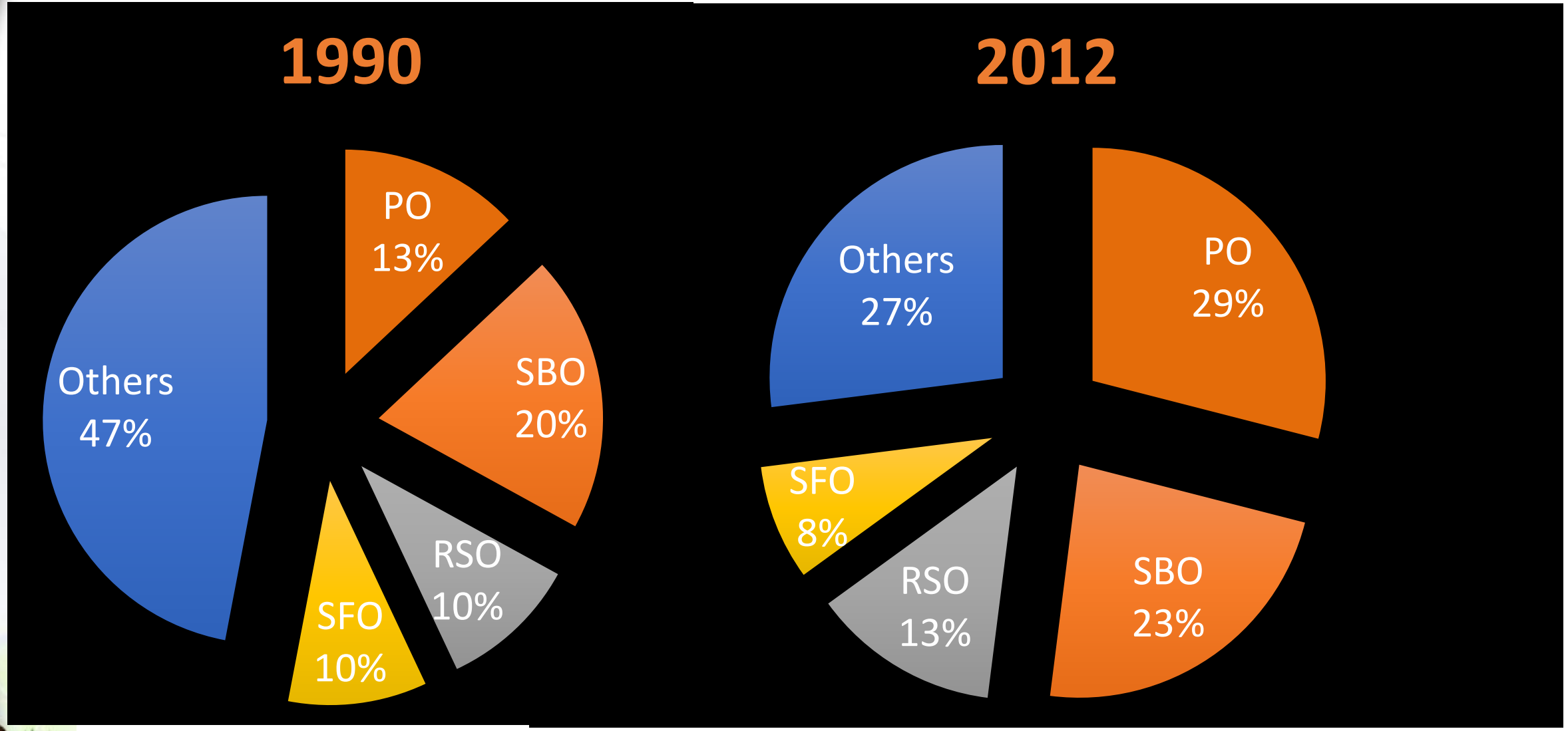


US Oils & Fats: Consumption



(Source : Oil World)

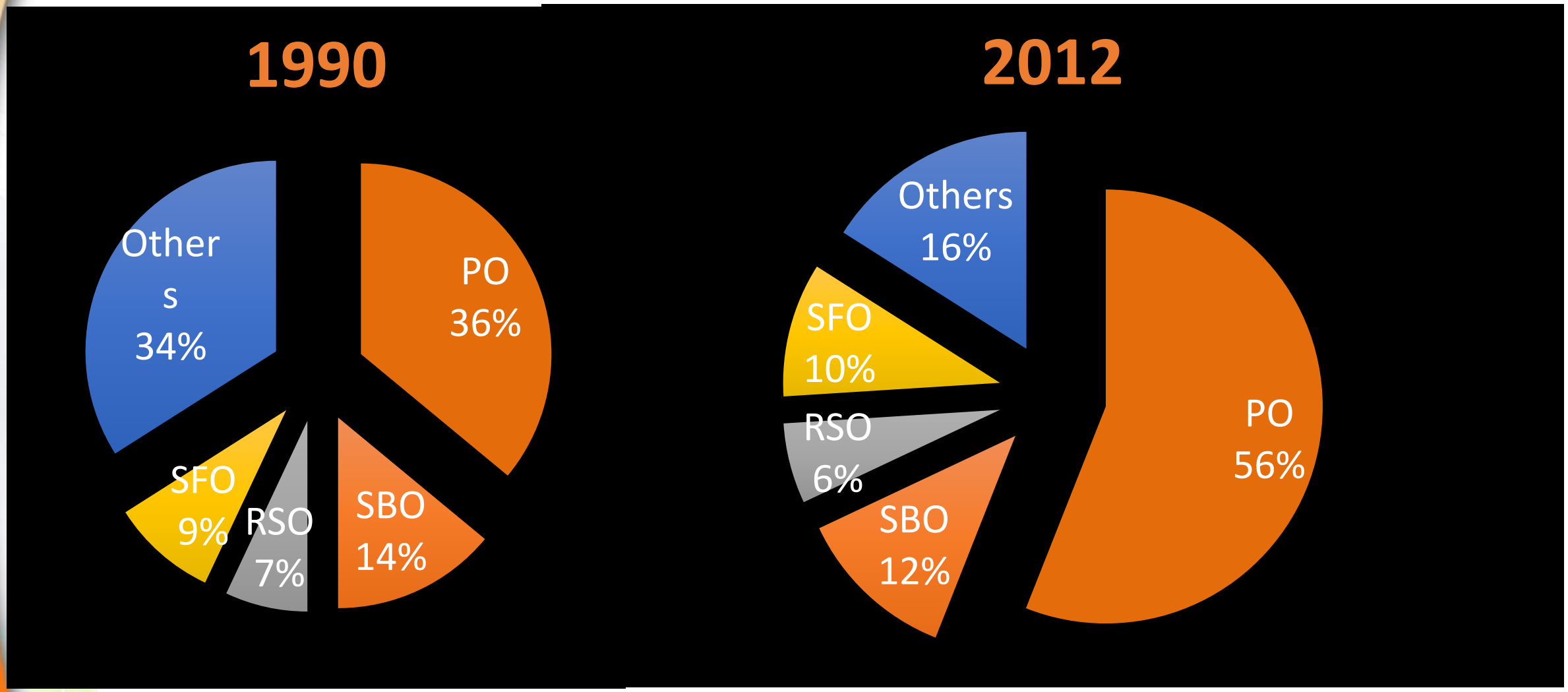
GLOBAL OILS AND FATS: PRODUCTION



Total Production: 80.91 mil MT

Total Production: 183.61 mil MT

GLOBAL OILS AND FATS: EXPORT



Total Export: 23.1 mil MT

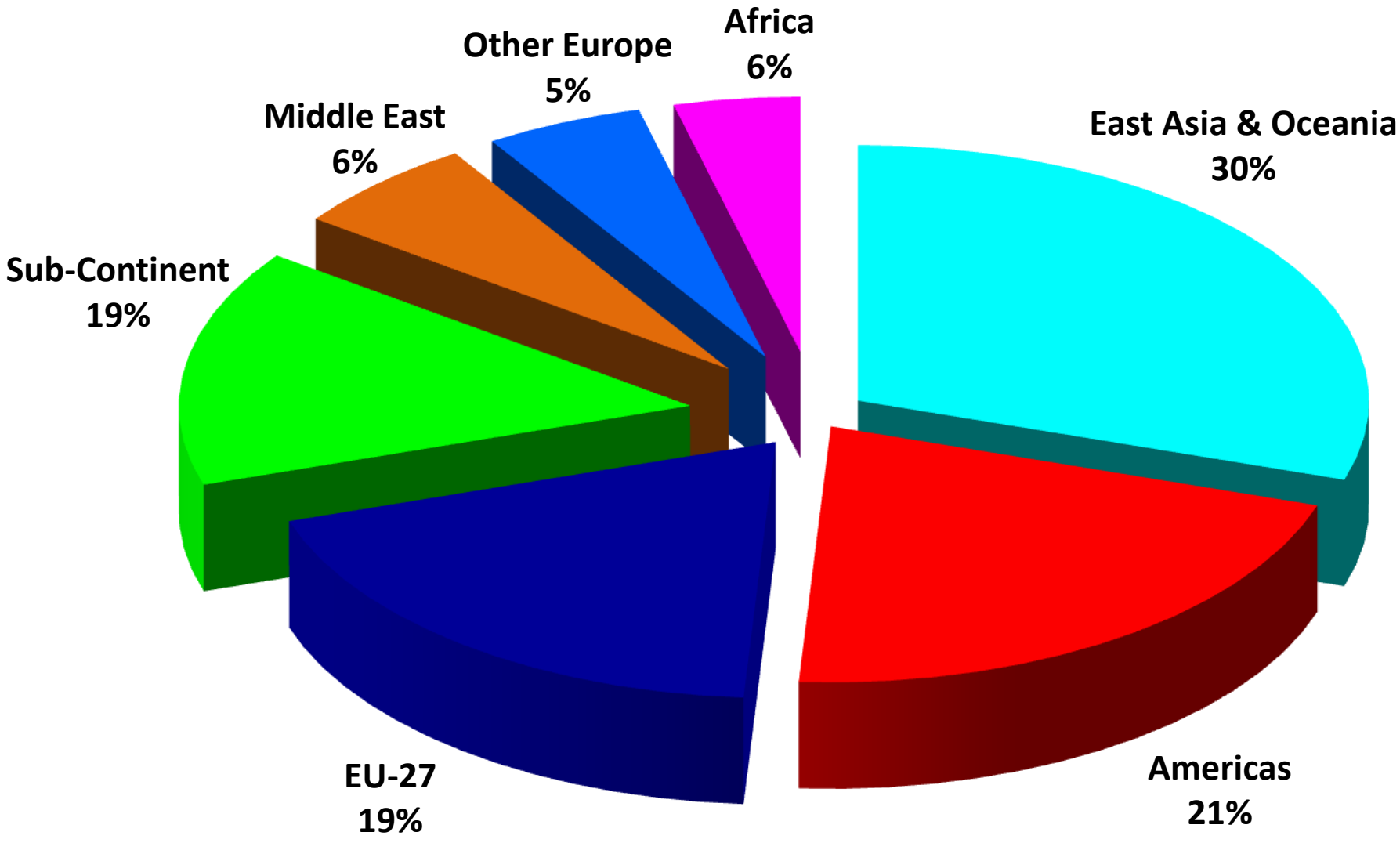
Total Export: 72.34 mil MT

MAJOR CONSUMERS OF OILS AND FATS

Country	Population (Million)	Consumption (Million MT)	Kg/yr
China	1,354	34,290	25.32
EU-27	504	23,540	46.71
India	1,241	18,870	15.21
USA	315	17,470	55.46
Indonesia	242	8,310	34.34
Brazil	197	7,840	39.8
Pakistan	182	3,880	21.32
Argentina	41	3,500	85.37
Russia	143	3,220	22.52
Egypt	84	1,950	23.21

(Source : Oil World)

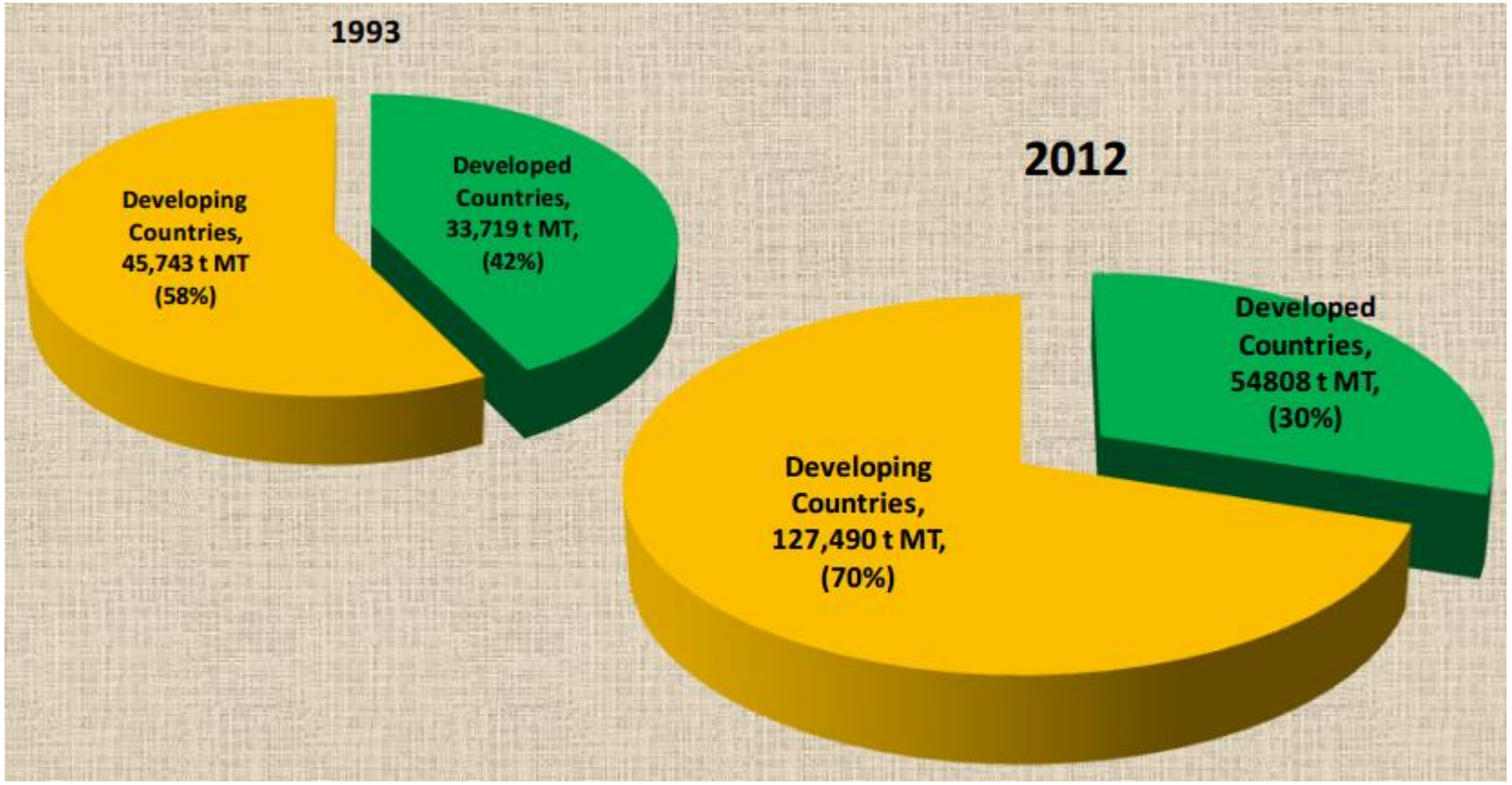
GLOBAL OILS AND FATS: CONSUMPTION



Total Consumption: 182.29 mil MT

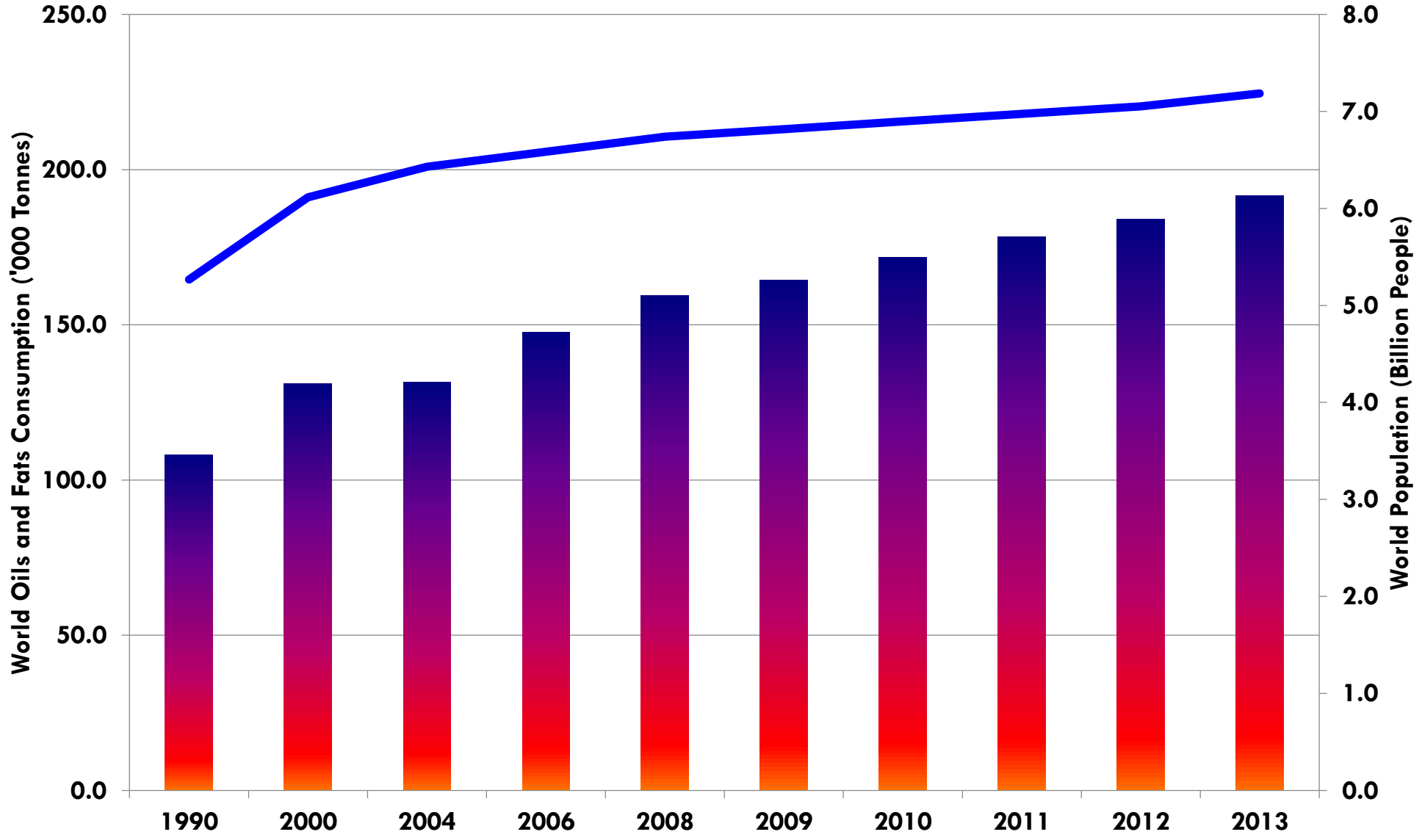
(Source : Oil World)

Global Oils and Fats Consumption:
Developed vs Developing Countries



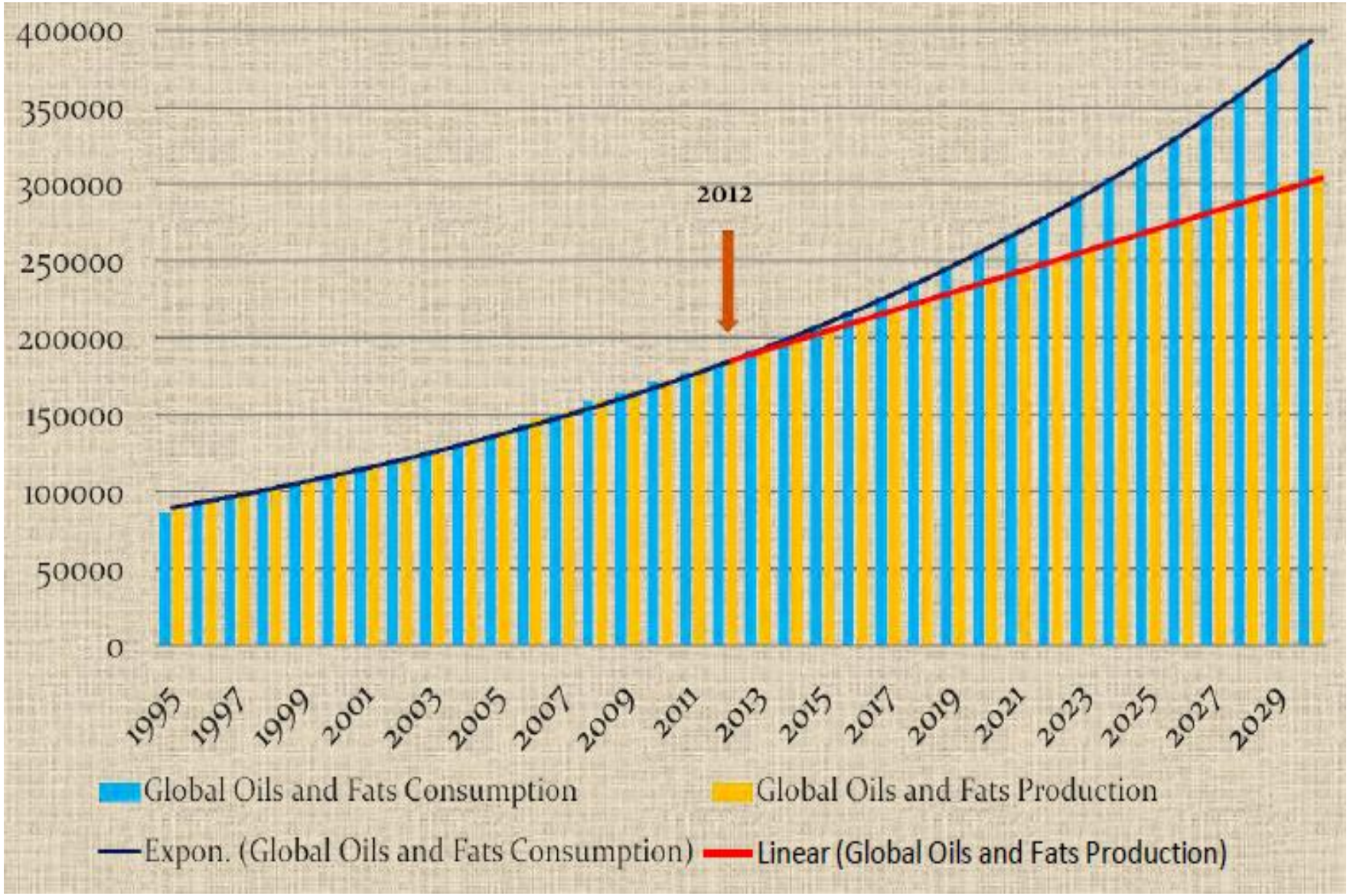
(Source : Oil World)

INCREASING POPULATION AND OILS & FATS DEMAND



Source: Oil World

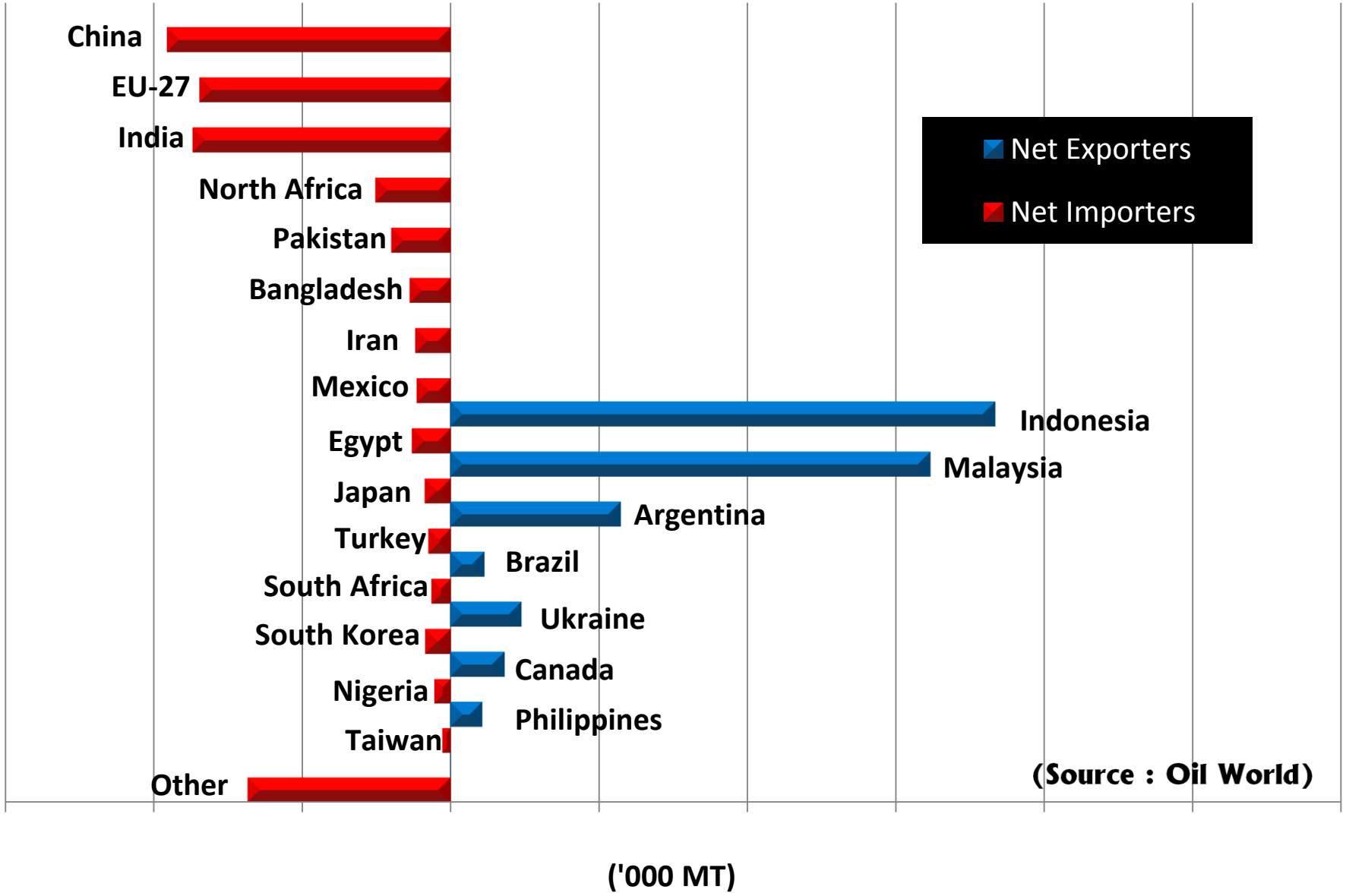
Global Oils & Fats: Supply vs Demand



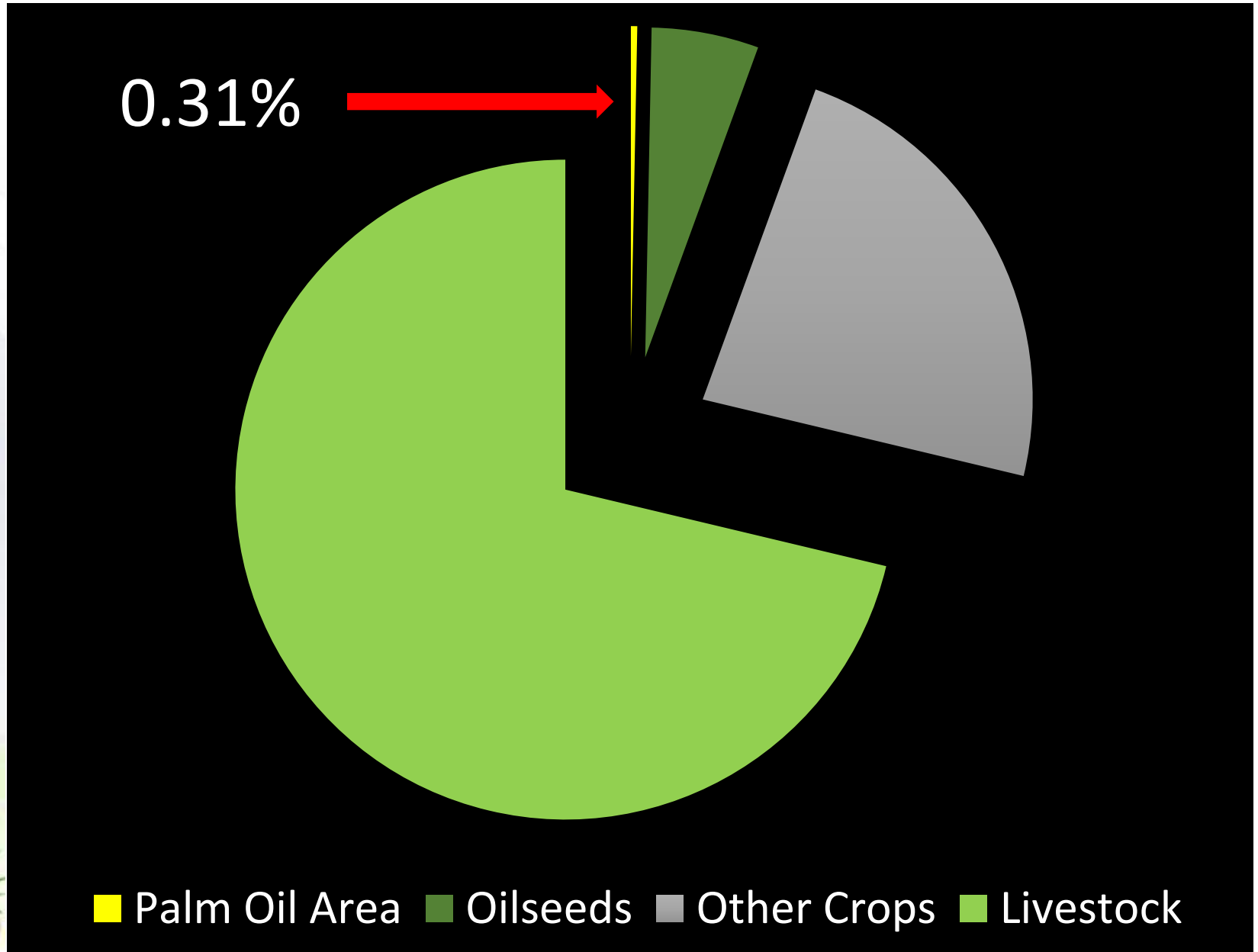
(Source : Oil World)

GLOBAL OILS AND FATS: TRADE

- Net importers outnumber net exporters.



LAND USE: PALM OIL



- Total available landbank: 4.9 bil ha.
- 98% of all food comes from land.
- 15 crops provide roughly 90% of calories consumed by humans.
- Globally, 1.47 bil ha of land is used for agriculture.
- Oil palm occupies ?? % of the area?

LAND USE: MALAYSIAN PALM OIL

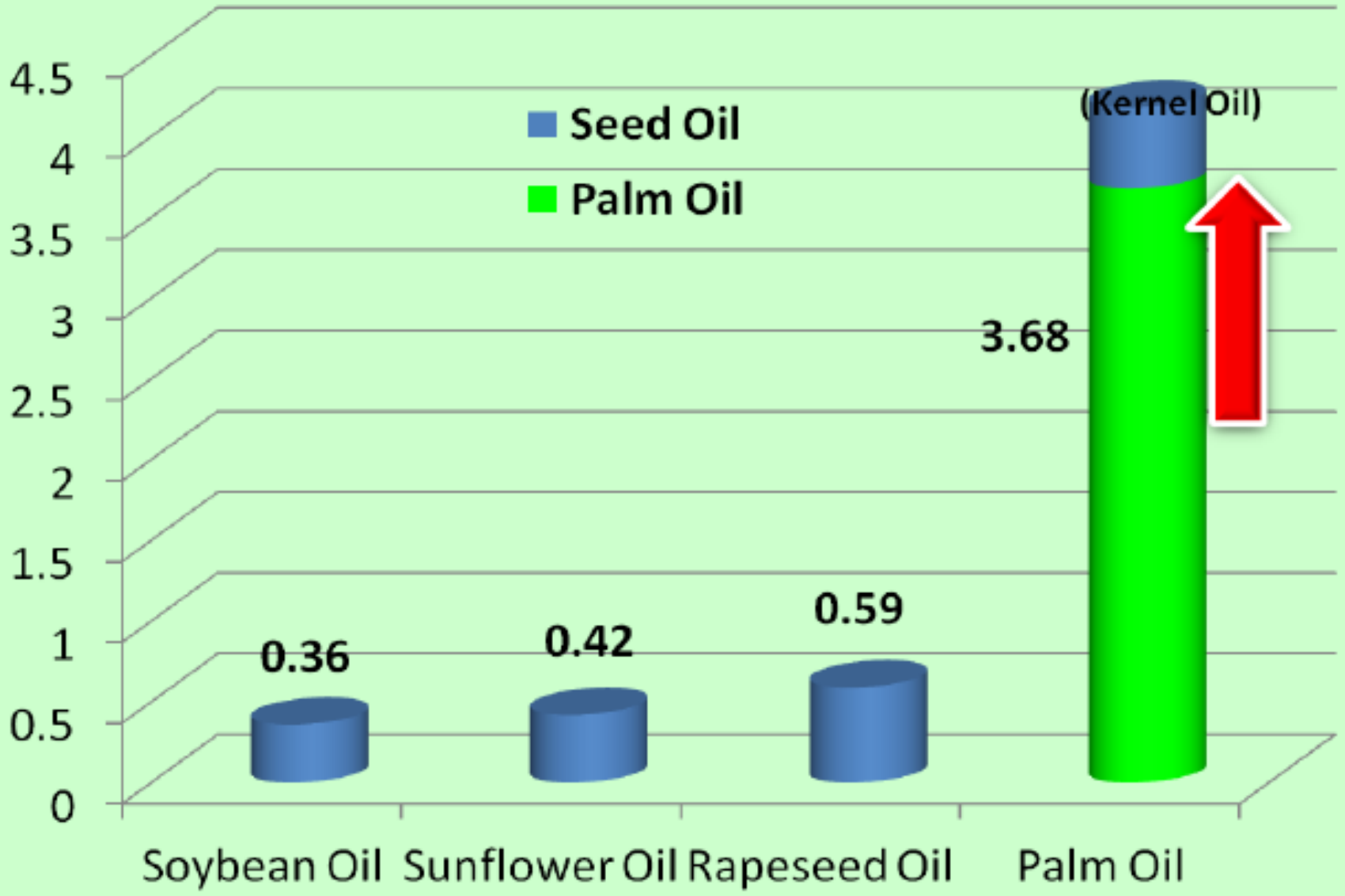
Parameter	Area or %
Area of oil palms	5.08 mil ha
Malaysia's agricultural land area	6.89 mil ha
World's harvested oil seed area	252.83 mil ha
World's agricultural land area*	4,960 mil ha
% of oil palm area against Malaysia's agricultural land area	73.7%
% of oil palm area against world's harvested oil seed area	**1.97 %**
% of Malaysian oil palm area against total world's agricultural land area	**0.1%**
Malaysian oil palm's contribution (inclusive of CPKO) to global oils & fats production	**11.3%**

*Sources: Malaysian Palm Oil Board (2012), Oil World (2012) and * World Bank*

✓ **In Malaysia, for every hectare of oil palm there is 3.68ha of forest permanently protected for conservation of biodiversity and wildlife.**

✓ **Malaysia commits to conserve minimum 50 % permanent forest.**

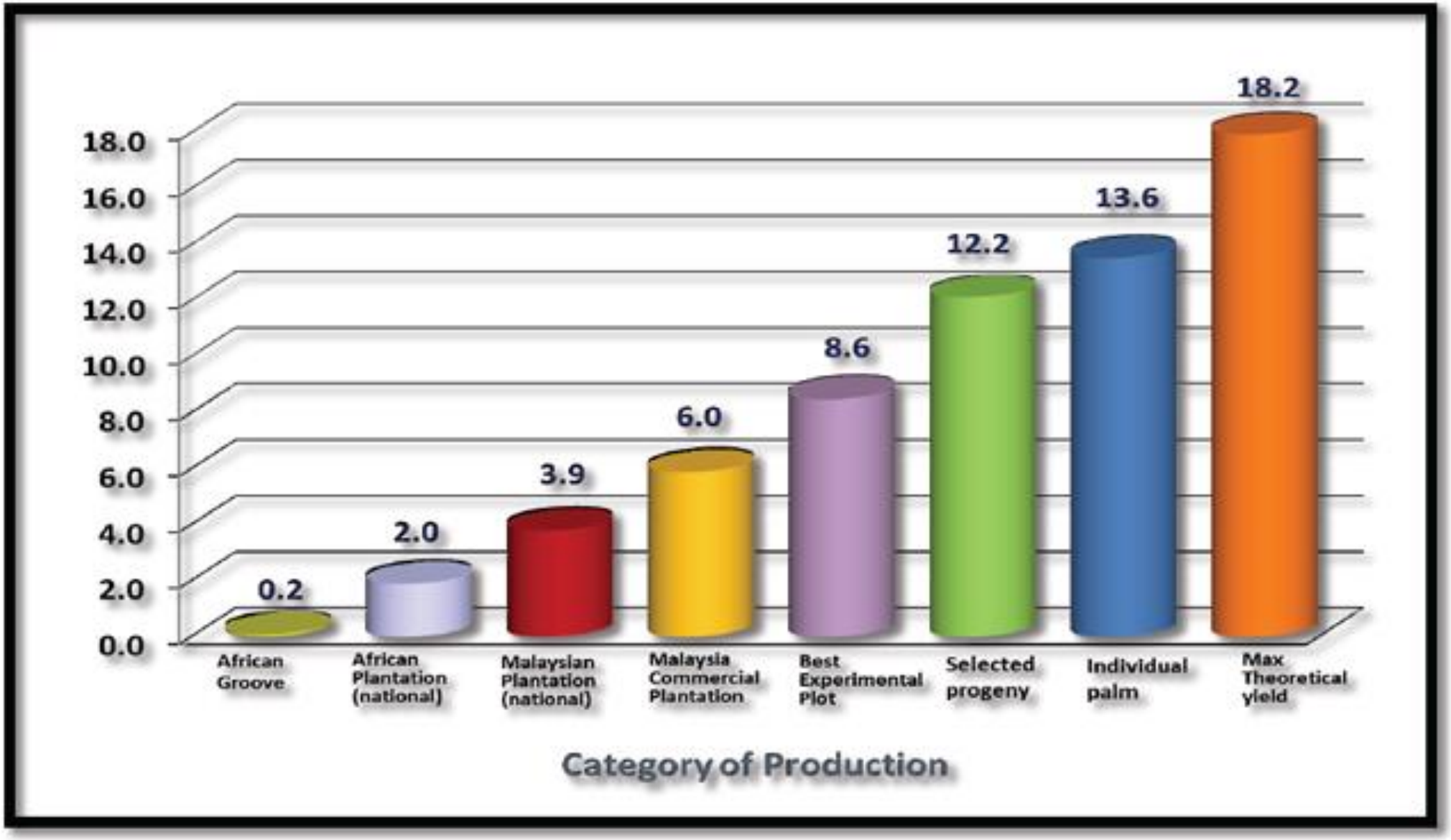
PALM OIL: PRODUCTIVITY



Productivity of oil palm is:

- 11x more than soyabean
- 10x more than sunflower
- 7x more than rapeseed

OIL PALM YIELD



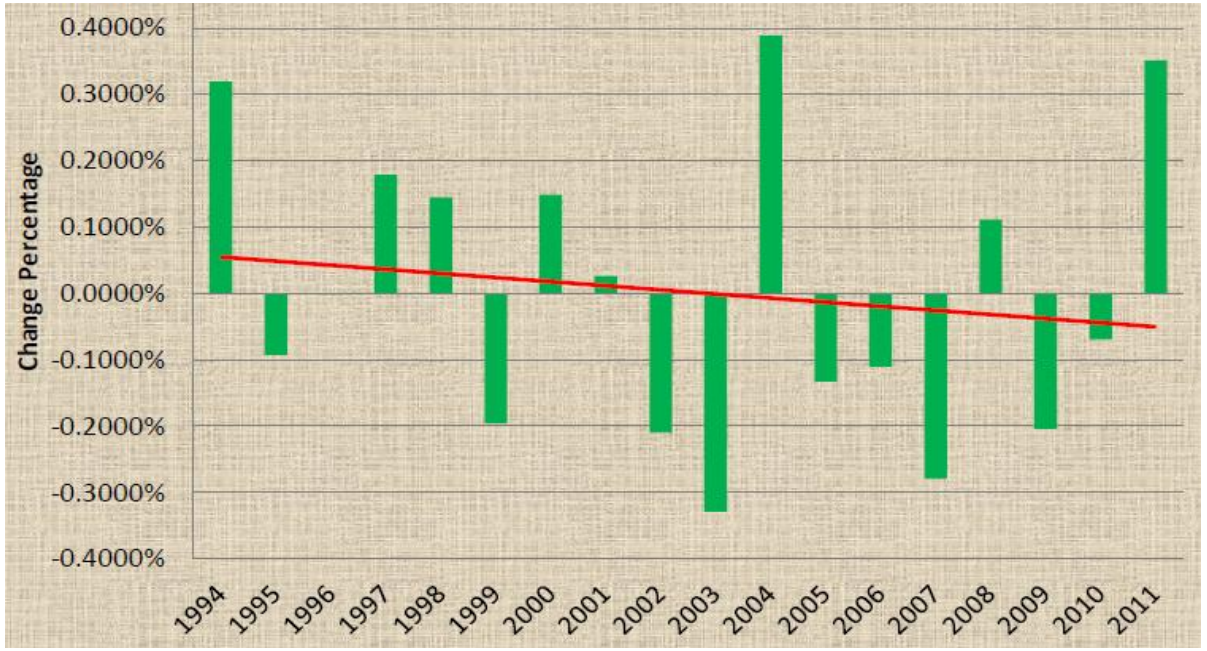
Palm oil yield potential – ton/Ha.

Land: A Shrinking Resource

- In 1960, the average hectare of arable land, globally, supported 2.4 persons.

- By 2005, this figure had increased to 4.5 persons per hectare.

- By 2050, the estimate by FAO is that a single hectare of land will need to support between 6.1 to 6.4 people.



Palm Oil: Food Security

Year Population (billion)	2025 7.9	2040 8.5	2080 9.1
Projected Additional Palm oil to be supplied by Malaysia (m MT)	**2.7**	**5.3**	**7.7**
Estimated Additional land needed for palm oil cultivation in Malaysia (m ha)	**0.7**	**1.4**	**2.1**
Additional land needed to cultivate **Rapeseed** to offset this oil palm cultivation (m ha)	**4.5**	**9.0**	**13.4**
Additional land needed to cultivate **Sunflower** to offset oil palm cultivation (m ha)	**5.7**	**11.3**	**17.0**
Additional land needed to cultivate **Soybean** to offset oil palm cultivation (m ha)	**7.2**	**14.4**	**21.6**

LICENSED ACTIVITIES IN MALAYSIAN PALM OIL INDUSTRY

PLANTATION

OIL PALM SEEDS

ESTATE

PROCESSING

PALM OIL MILL

REFINERY

CRUSHING FACTORY

OLEOCHEMICAL PLANT

SERVICES

INSTALLATION

EXPORTER

TRADING

OIL PALM SEED DEALERS

FFB DEALER

TRANSPORTER

SERVICES

REPACKER

LABORATORY

SURVEYOR

Malaysian Palm Oil: Highly Regulated

1) ***Land Acquisition Act 1960***
2) ***Land Conservation Act 1960 revised in 1989***
3) ***National Land Code 1965***
4) ***Protection of Wildlife Act 1972***
5) ***Environmental Quality Act 1974 (Environmental Quality) (Prescribed Premises) (Crude Palm Oil) Regulation 1977***
6) ***Environmental Quality (Clean Air) Regulation 1978***
7) ***Labor Law***
8) ***Workers' Minimum Standard of Housing & Amenities Act 1990***
9) ***Occupational Safety & Health Act 1977***
10) ***Pesticides Act 1974 (Pesticides Registration) Rules 1988***
11) ***Pesticides (Licensing for sale & storage) Rules 1988***
12) ***Pesticides (Labeling) Regulations 1984***
13) ***Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987***
14) ***Factories & Machinery (Noise Exposure) Regulations 1989***

Subject to more than 50 laws and regulations

Facts About Palm Oil

Sustainable

- *The only vegetable oil with internationally recognised sustainable certification*

Natural

- *Free of GMO*
- *Expeller-pressed oil*

Versatile

- *Semi-solid*
- *Naturally stable – excellent for frying*

Healthy

- *Well-balanced natural oil with unique composition of fatty acids (50:50)*
- *Free of trans fatty acid*
- *Contains vitamin E, Carotenoids & other phytonutrients*
- *Cholesterol free*

Most cost effective raw material - price and quality

Consistent and abundance in supply

EVENT OF THE YEAR

www.mpob.gov.my

Thank you