

Potential for Palm Olein in Morocco

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INTRODUCTION

Morocco is one of the five North African countries formed as the Arab Maghreb Union under the Treaty of Marakesh in February 1988. The population is about 27 million. The country's per capita consumption of oils and fats is about 14 kilograms, the lowest among the North African countries. With only 37% self-sufficiency, Morocco is deficit in oils and fats. Thus she needs to import oils and fats to meet the shortfall (*Table 1*). In this paper, the possibility of using palm olein in the Moroccan market is assessed in order to generate some options for Morocco to overcome the shortage, especially of liquid oils.

TABLE 1. POPULATION AND OILS/FATS SITUATION IN MOROCCO (1990-1993)

Key Facts	1990	1991	1992	1993
Population (million)	25.1	25.7	26.3	27.0
Production ('000 tonnes)	115.1	119.4	125.1	143.8
Exports ('000 tonnes)	34.4	11.0	8.2	3.6
Imports ('000 tonnes)	245.0	261.5	285.8	240.9
Consumption ('000 tonnes)	243.0	350.4	362.7	382.9
Consumption per capita (kg)	13.7	13.6	13.8	14.2
Self-Sufficiency (%)	33.6	34.1	35.5	37.6
Consumption Pattern:				
Liquid Oils (%)	93.0	93.0	93.0	93.0
Solid Fats (%)	7.0	7.0	7.0	7.0

Source: Oil World, 1994 and MSA Kheiri, 1991.

SITUATION OF OILS AND FATS

Traditionally, Morocco has been a producer and user of olive oil. Due to its stagnant production and the increasing local demand for liquid oils, decreasing amounts of olive oil are exported although world prices are attractive (*Table 2*). In order to obtain more liquid oils for the country, some hard currency earned from exports of the expensive olive oil is used to finance the imports of less expensive oils. Imports of soya bean and sunflower oils however, are financed by credit facilities given by the USA.

Table 2 shows that olive and sunflower oils were the main oils produced in Morocco. Their

contributions were about 31% and 52% respectively of the total production of 1993. Other oils, namely soya bean oil and rapeseed oil (colza), were also produced but were of insignificant quantities. The oils exported by Morocco were olive and fish oils. In 1990, there was a drastic upsurge in exports of olive oil from 500 tonnes in 1989 to 29 700 tonnes in 1990. But exports declined again to 3 500 tonnes in 1991. The high export in 1990 was mainly brought about by the peak in the production cycle of the olive crop.

TABLE 2. STATISTIC FOR SELECTED OILS AND FATS IN MOROCCO

Oils/Fats	1989-93 ('000 tonnes)				
	1989	1990	1991	1992	1993
Production	105.7	110.1	120.3	125.1	143.8
Sunflower	52.5	39.9	56.9	60.5	74.2
Olive	44.2	61.1	46.8	53.7	44.7
Fish	6.6	6.3	6.7	7.3	6.7
Imports	243.3	194.3	242.3	285.8	240.9
Soya bean	122.7	94.9	82.8	188.0	134.0
Sunflower	8.9	7.5	6.0	6.3	4.0
Rapeseed	72.1	58.1	108.7	43.0	61.0
Corn	1.2	0.4	0.0	0.1	-
Palm Oil	3.7	5.4	9.6	6.8	7.4
Palm Kernel	1.1	0.9	2.0	2.6	0.9
Exports	1.7	34.5	7.2	8.2	3.6
Olive	0.5	29.7	3.5	5.5	2.9
Fish	1.2	4.8	3.7	2.7	0.7
Domestic Disappearance	324.7	323.0	346.4	362.7	382.9
Soya bean	109.5	131.5	84.4	153.1	153.7
Sunflower	61.4	47.7	64.8	62.7	78.2
Rapeseed	71.1	66.1	106.8	51.2	57.5
Olive	37.0	42.4	42.6	43.0	45.6
Palm Oil	3.7	5.4	9.6	6.8	7.4
Palm Kernel	1.1	0.9	2.0	2.6	0.9
Fish Oil	5.5	1.5	3.0	4.3	6.0

Source: Oil World, 1994

The market share for the main oils used in Morocco is shown in *Table 3*. In 1993, the four main oils which were soya bean, sunflower, rapeseed and olive contributed to 87.4% of the market share of oils and fats, or almost 100% of the market share of liquid oils. Olive and sunflower oils were extensively consumed and regarded as high quality liquid oils.

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The share for palm oil in Morocco during 1993 was only 2%. Palm oil is not utilized as a liquid oil but used in the formulation of fat products and soaps.

TABLE 3. MAJOR OILS MARKET SHARE IN MOROCCO INCLUDING LIQUID OIL (1992 and 1993)

Major Oils	('000) tonnes		*Market Share(%)		Liquid Oils Market Share (%)	
	1993	1992	1993	1992	1993	1992
Olive Oil	45.6	43.0	12	12	14	14
Soya bean Oil	153.7	153.1	40	42	46	49
Sunflower Oil	78.2	62.7	20	17	23	20
Rapeseed Oil	57.5	51.2	15	14	17	17
Palm Oil	7.4	6.8	2	2	-	-
Total	382.9	362.7			335.0	310.0

*Note: From the total consumption of 362 700 tonnes in 1992 and 382 900 tonnes in 1993.

CONSTRAINTS

Morocco, although already importing some palm products for making margarine, shortening and soap, has not so far responded to the idea of using olein as a cooking oil. The unacceptability of using palm olein in the formulation of liquid oil is perhaps due to lack of information and experience in using palm products. However, experience shown by other North African countries, especially Algeria and Egypt, may necessitate a review of the Moroccan regulations on oils and fats.

LIQUID COOKING OIL – POTENTIAL FOR PALM OLEIN

In Morocco, liquid cooking oil has 93% share of the total edible oils and fats market. RBD palm olein,

single or double fractionated, has some potential to compete for the share of the liquid oil market in Morocco. Figure 1 and Table 4, show average minimum and maximum temperatures, in the important cities in Morocco. The average minimum ambient temperature throughout the year, in the two major cities – Casablanca and Fes is below 20°C. As such, a liquid oil based on 100% normal palm olein would not remain clear throughout the year. It might be feasible to market a clear liquid cooking oil based on 100% double fractionated palm olein (IV 62–65) for six months i.e. during the months of May to October when the minimum ambient temperature in Morocco is above 10°C.

The lowest temperature reached during the year is about 4°C. A liquid cooking oil based on blends of liquid vegetable oils and palm olein (normal or double fractionated) would have a much higher cold stability. As such, it would have a better chance for acceptance as a liquid cooking oil in Morocco.

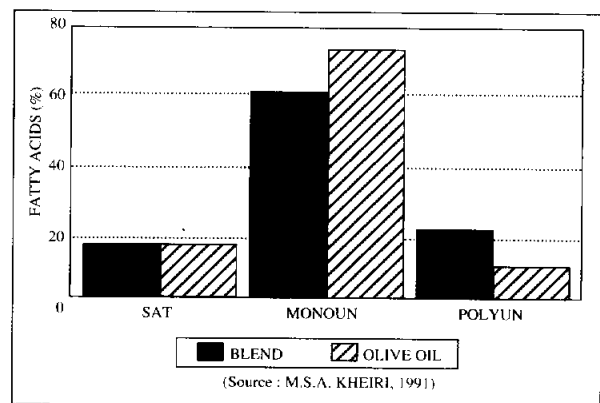


Figure 1. Composition : Blend and Olive Oil POo: Lerso (30:70) Blend

TABLE 4. MOROCCO: MAXIMUM AND MINIMUM TEMPERATURES (°C) IN MAJOR CITIES

Months	Casablanca		Fes		Agadir		Marrakech		Oujda		Tanger	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Jan	17	7	16	4	20	7	19	5	15	4	15	10
Feb	18	8	17	5	22	9	21	6	17	4	16	10
Mar	20	9	20	8	23	11	23	9	19	6	17	11
Apr	21	11	22	9	24	13	26	11	22	8	19	12
May	22	13	26	12	24	15	29	14	25	11	21	14
Jun	24	16	31	15	25	17	33	17	30	14	24	17
Jly	27	18	36	18	26	18	38	19	35	17	26	19
Aug	27	19	36	18	27	18	38	20	35	18	27	19
Sep	27	17	32	16	27	17	32	18	31	16	25	18
Oct	25	15	26	13	26	15	29	14	25	12	22	16
Nov	21	11	20	9	24	12	23	10	19	8	19	13
Dec	16	9	16	5	21	8	19	6	16	5	16	10
Average	22.1	12.8	24.8	11.0	24.1	13.3	27.5	18.0	18.1	10.3	20.6	15.8

Source: MSA Kheiri and MRM Jaais, 1991.

PORIM has suggested a blend based on 30% RBD palm olein and 70% colza or sunflower oil to the refiners. This level of incorporation would create a market for 60 000 tonnes of palm olein per year.

In all, there are 13 private refineries in Morocco. 70% of the production is controlled by only four refineries under a consortium owned by the Royal family of Morocco. The total refinery capacity is around 300 000 tonnes per year. Under the liberalization policy, oils and fats are allowed to be imported by private refiners. If palm oil products were imported, the potential for Moroccan market would be as follows:

30% in liquid cooking oil	: 60 000 tonnes
30% in soaps	: 7 000 tonnes
Margarine/Shortening	: 10 000 tonnes
PK products	: 1 000 tonnes
Total	78 000 tonnes

SINGLE VERSUS BLENDED OILS

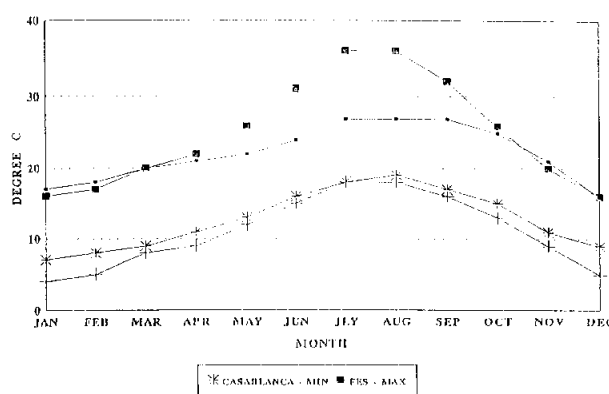
In the case of Morocco, it is calculated that from the 93% liquid oil consumption pattern, a total of 356 190 tonnes of liquid oils were required in 1993. Soya bean oil, rapeseed oil and sunflower oil are the main liquid oils used, besides the traditional olive oil. Palm olein can be blended with any one of these oils without sacrificing the quality aspects of the liquid oils produced.

For instance, a 50:50 blend of colza oil or soya bean oil with single-fractionated (SF) olein can be economically utilized for the summer months. It will remain clear for a minimum of three months at a minimum temperature of 20°C. However, if a blend is required to remain clear at 15°C or below for more than three months, the proportion of single-fractionated palm olein should be less than 20%. Alternatively, if more double-fractionated olein (DF olein) is used, higher proportions could be added in the blends because it performs better in temperate climates than SF olein. A blend containing 30% DF palm olein (IV 60, cloud point 5.6°C or IV 65, cloud point 5.0°C) with 70% of either soya bean, colza oil or sunflower oil; will remain clear for three months or more even at 10°C. At higher temperatures, more double-fractionated olein can be incorporated (Y K Teah, 1991 and Noraini Idris, 1992).

It has been found that palm olein blended with rapeseed oil will produce a good quality blended oil.

For instance, it can be seen from *Figure 1* that the fatty acid composition (FAC) of a 30:70 blend of olein and rapeseed oil is close to that of olive oil (MSA Kheiri, 1991).

In the case of Morocco, it can be seen from *Figure 2* and *Table 4* that the prevailing temperatures in the country are in the range of 4°C to 38°C. To suit this requirement, blends of palm olein of different iodine value with different formulations can be employed. The employment of such formulations will create many benefits to the users.



(Source : MSA Kheiri and MRM Jaais, 1991)

Figure 2. Morocco: Maximum and Minimum Temperatures

Palm products from Malaysia which are available for trade are processed products while the other oils and fats are in the crude form. The premiums or discounts of some of these oils and fats are shown in *Table 5*. It can be seen that during 1993 RBD palm olein was at a discount of US\$107 to soya bean oil and US\$166 to sunflowerseed oil. However, it was at a very low discount to rapeseed oil by US\$32.

TABLE 5. PREMIUMS/DISCOUNTS OF PALM PRODUCTS AGAINST OTHER MAJOR OILS AND FATS, 1993 (US\$/tonnes)

Oils and Fats	1993 Price per tonne (US\$)	1993 Premiums (+)/ Discounts (-) RBD Palm Olein
RBD Palm Oil (CIF)	422	nr
RBD Palm Olein (CIF)	434	nr
Soya bean Oil (CIF)	541	-107
Rapeseed Oil (CIF)	466	- 32
Sunflowerseed Oil (CIF)	600	-166
Crude Palm Oil (CIF)	378	nr

*Source: Oil World 1994

Taking into consideration the premiums/discounts, the processing costs and the processing losses, it is shown that RBD palm olein still offers a competitive edge over the other crude oils. As illustrated in *Table 6*, one would have to spend an additional US\$140.95 for every tonne of crude soya bean oil that is imported before it can be consumed when compared to RBD palm olein. For sunflowerseed oil, it would be an additional US\$201.22 per tonne while for rapeseed oil the marginal cost would be US\$62.10. Crude rapeseed oil happened to be at discount of US\$29 over RBD palm olein only in 1992. Prior to that, crude rapeseed oil had always commanded a premium over RBD palm olein. In 1990, the premium was US\$90/tonne while in 1991 it was US\$21.00. In 1993, again, crude rapeseed oil was at premium of US\$32/tonne over RBD palm olein.

TABLE 6. SUMMARY OF COSTS AND BENEFITS, 1993 (US\$)

Items	Crude			RBD
	SBO	SFO	RSO	Palm Olein
CIF Prices	541	600	466	434
Cost differential	107	166	32	-
Add cost of chemicals	14	14	14	-
Add cost of process losses	19.95	21.22	16.10	-
Total	140.95	201.22	62.10	0.0

Palm olein can be blended with a more percentage of unsaturated oil to provide physical stability as measured by the cloud point. In Japan, a blend of 50% palm olein and 50% rapeseed oil is being marketed successfully. In Algeria and Egypt, a blend of 30% palm olein and 70% rapeseed oil or sunflower oil (SFO) is currently available in the markets. In

addition, Egypt provides the flexibility of higher proportions of palm olein in their blends based on seasonal variations such as climatic and temperature difference according to locations. In the case of Morocco, a similar blending formulation such as that being practiced in Algeria and Egypt could be implemented as a start.

From *Table 7*, it can be seen that there would be economic gains if RBD palm olein were to be blended with the other major oils. For blends of soya bean oil and sunflowerseed oil with RBD palm olein (SF and DF), economics gains would be obtained. For instance, US\$60.37 per tonne would be saved by blending SFO with RBD palm olein (SF) while US\$42.37 would be gained if blended with RBD palm olein (DF). Though there is no significant gain by blending RBD palm olein with rapeseed oil, this is only true for years where the price of RBD olein increased in the world market. The rise in price was brought about by the increased in demand for palm olein due to the shortage in the supply of oils and fats. Hence, the prices of RBD palm olein and rapeseed oil should be closely monitored.

The economics of blending depend on the price differentials between RBD palm olein and the other major oils that are used in the blends. For instance, a price differential of US\$141/tonne in favour of palm olein would generate a saving of US\$42.29. Since the shortage of liquid oils in Morocco is about 240 900 tonnes, imports of oils that are blended would generate a saving of US\$10.2 million. These savings could be used to purchase more oils in the forthcoming years.

According to Kheiri (PORIM, 1991), blended oil of 30:70 between palm olein and colza oil, is characteristically similar to olive oil. On the other hand, Marvin Bierenbaum (Kenneth L Jordan, 1990) claimed that a blend of 40:60 between palm olein and

TABLE 7. COST OF BLENDED OILS BASED ON 30:70 FORMULATION BETWEEN PALM OLEIN (SF and DF) AND OTHER MAJOR OILS, 1993

Oils	Oils (100%)	Palm olein (30%)	Other oils (70%)	Blends (30:70)	Savings
RBD olein (SF):	434.00	130.20			
-soya bean oil	574.95	130.20	402.47	532.67	42.29
-sunflowerseed oil	635.22	130.20	444.65	574.85	60.37
-rapeseed oil	496.10	130.20	347.27	477.47	18.63
RBD olein (DF):	494.00	148.20			
-soya bean oil		148.20	402.47	550.67	24.28
-sunflowerseed oil		148.20	444.65	592.85	42.37
-rapeseed oil		148.20	347.27	495.47	1.47

canola oil, results in dietary effects upon serum lipids and platelet aggregation similar to that of fish oil. In 1993, Morocco exported about 2 900 tonnes of olive oil and 700 tonnes fish oil (*Table 2*). At the same time, about 45 600 tonnes olive oil and 6 000 tonnes of fish oil were consumed locally. However, if the amounts for local consumption were replaced by such 'blended oils', then, more expensive oils could be exported by Morocco. This replacement, therefore, will generate more hard currency earnings to help finance the import of cheaper oils.

CONCLUSION

The current status of demand and supply of edible oils and fats in Morocco were assessed to gauge the

future trends in production, imports and consumption of edible oils especially liquid oils. The current usage pattern of edible oils are high in liquid oils as compared to solid fats. Morocco is only 37.6% self-sufficient in the country's total consumption of oils and fats. The hard currency earned from the exports of expensive oils namely olive and fish oils, could be raised for purchasing inexpensive oil like palm olein for production of blended oils. This approach will assist to overcome the shortage of oils and fats, especially liquid oils, in the market.

Blending is gaining popularity and is well known to many intending users. The outstanding benefits of blending oils with palm olein are that it could bring down the costs, provide good quality oil and could be suited to any targeted market.

Supply and Disappearance – A Review

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After a robust production year in 1993, where production of palm oil increased from 6.373 million tonnes in 1992 to reach 7.403 million tonnes, the golden crop of Malaysia is expected to go into its resting stage in 1994. The first half year production in 1994 was 3.044 million tonnes, a decline of 118 549 tonnes or 3.7% over production of the same period the previous year. Monthly production for the first three months of 1994 were higher than that of the corresponding period in 1993 (*Table 1*). However, monthly production from April to June in 1994 were much lower than that of the corresponding months in 1993 leading to cumulative production for the first six months in 1994 to be lower. Production forecast for 1994 is now revised to be about 7.50 million tonnes from the earlier forecast of 7.52 million tonnes.

The large increase in production of palm oil in 1993 resulted in stocks carry-over into 1994 to be large at 1.17 million tonnes as against beginning stocks of 0.66 million tonnes the year earlier. Based on expected production in 1994 and stocks beginning of the year, total availability of palm oil for trade is

estimated at 8.67 million tonnes. The amount of palm oil traded in the first six months of 1994 totalled 3.25 million tonnes, registering an increase of about 433 000 tonnes or 15.36% over exports of the previous year. The major importers of Malaysian palm products for January–April 1993 and 1994 are shown in *Table 2*.

In the first four months of 1994, China was the largest importer of Malaysian palm products. The imports during the period were 402 540 tonnes, an increase of 280 039 tonnes over the same period the previous year. Her imports during January–April 1994 comprised 261 502 tonnes RBD palm olein, 64 631 tonnes RBD palm stearin, 61 971 tonnes RBD palm oil and 14 434 tonnes crude palm olein. Increased imports of palm products were brought about by the severe drought conditions in the country causing threats to yield oil bearing crop. Hence China had to import more palm oil products since their prices were more favourable when compared with prices of other vegetable oils while taking advantage of the slight weakening in prices of oils and fats during the period. It is anticipated that more palm