

Reflections on Crude Palm Oil Quality

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According to the archaeologists the Egyptians were producing palm oil as early as 3000 BC, but whether the Pharaohs used the oil for edible purposes, or otherwise, is not certain. However, it is fairly certain that crude palm oil has been used from time immemorial by the peoples of West Africa as a food. The African produced his oil by primitive means to suit the local tastes or food recipes. Thus in parts of the Delta area of Nigeria the *banga* soup required oil of ten per cent free fatty acid (FFA), while in Sierra Leone the taste of *palaver* soup required on oil of over twenty per cent FFA.

Trade in palm oil started in the eighteenth century and according to a Major Stubbe (1931) the early export tonnages of palm oil from West Africa were as follows:

1790	-	130 tonnes
1820	-	1 287 tonnes
1830	-	10 673 tonnes
1840	-	15 772 tonnes

Although no figures for the FFA were given it is fairly certain that the FFA was well over thirty per cent based on the figures reported by JHJ Farquhar (1913) which were as follows:-

	FFA%	Water%	Dirt%
Old Calabar Soft	- 10.5	0.7	0.1
Old Calabar Hard	- 45.3	1.0	0.2
New Calabar Hard	- 59.3	1.3	0.3

Before the First World War (1914-18) the three principal markets for palm oil were Liverpool, Marseilles and Hamburg but by 1922 it was predicted by AAL Rutgers (1922) that in future Amsterdam and Rotterdam may also become markets of importance for palm oil. Already by 1922 Sumatra had been shipping consignments of palm oil fit for edible purposes to Holland for the margarine industry. The contracts for palm oil sales at that time were mainly covered by the 'Official Contracts for Palm Oil and Shea Butter' edited by the Liverpool United General Produce Association

Ltd. As to quality, Schedule A of the contract gave the following classifications:-

SCHEDULE A - CLASSIFICATION OF PALM OIL

Class 1 - SOFT REGULARS: All oils testing not more than 25 per cent f.f.a. shall be tenderable in this class except those in classes 4 and 5.

Class 2 - MEDIUM REGULARS: All oils testing not more than 45 per cent f.f.a. shall be tenderable in this class except those in classes 4 and 5.

Class 3 - HARD: All oils testing not more than 60 per cent f.f.a. shall be tenderable in this class except those in classes 4 and 5.

Class 4 - SHERBRO/SIERRA LEONE TYPES: All oils originating in Conckry, Rio Nunez, Rio Pongo, Sierra Leone, Sherbo and their areas shall be tenderable in this class.

Class 5 - LOW IRREGULARS: All oils of the Ordinary Saltpond/Dixcove and Ordinary Congo Types shall be tenderable in this class.

Schedule C of the same contract stipulated the 'Basis of Free Fatty Acids for palm oil 18% as palmitic' and 'Deficiency or Excess on Contract Price per tonne for each 1% or proportionally for any fraction thereof 0.10%'.

The producers in Sumatra at that time were unhappy with the Liverpool contract as it was not intended for the selling of palm oil with very low percentages of free fatty acids (under 8%) to be used for edible purposes and were of the opinion that besides the classes made for African palm oil a new class should be made for 'edible palm oil' with a special premium for each percentage less of free fatty acid. It is also interesting to learn of a prediction made in 1922 about the method of palm oil shipment which at that time was in wooden casks: 'Perhaps in the future palm oil may be shipped in tanksteamers, but it will surely take several years more before Sumatra will produce sufficient quantities of palm oil to feed a regular transport in this way.'

It was not until the late forties that any great efforts were made to produce oils of low FFA and even in 1950 only 0.2% of the Nigerian exports had an FFA content of below five per cent. At this time the Pioneer Mills were introduced into West Africa and by 1963, 95% of the exported oil had an FFA content of 3.5% or less.

On the Malaysian scene Arnott (1963) reported the results of some 1500 analyses done by the Department of Agriculture of Malaysia between 1949 and 1962 and these are shown in *Figure 1*. He categorized the oils as follows:-

Very low	-	2.0% FFA
Low	-	2.0 to 2.7% FFA
Medium	-	2.8 to 3.7% FFA
High	-	3.8 to 5.0% FFA
Very high	-	5.0% FFA and above

and reported that most of the high and very high categories were obtained during 1949 to 1954 and after 1954 almost all samples were in the medium to low categories.

Oil production by the Malaysian Palm Oil Growers' Council in 1987 and 1988 reflects this pattern:-

WEIGHTED AVERAGE FFA

	1987	1988
January - March	2.97	2.87
April - June	2.67	2.71
July - September	2.81	2.89
October - December	2.91	3.12

Special oils of very low FFA, sometimes as low as 1.5%, are produced on request and fetch good premiums over the usual price. At present crude palm oil in Malaysia is generally traded based on FFA, not more than 5%; moisture and impurities 0.25% maximum.

Quality in regard to oxidation is an important aspect to consider as it affects not only the bleachability performance of the crude oil, but also the stability and shelf life of the products. Improvement in oil quality is reflected in the data extracted from Jacobsberg's study carried out in 1973 (Jacobsberg, 1974) and Siew's survey of 1987 (Siew *et al*, 1989). In the 1973 study, the peroxide values of the oils received at bulking installations were from 2 to 12 meq/kilogram, 89% of the total tonnage being below 6 meq/kilogram. Of the total tonnage loaded into the ships, about 70%

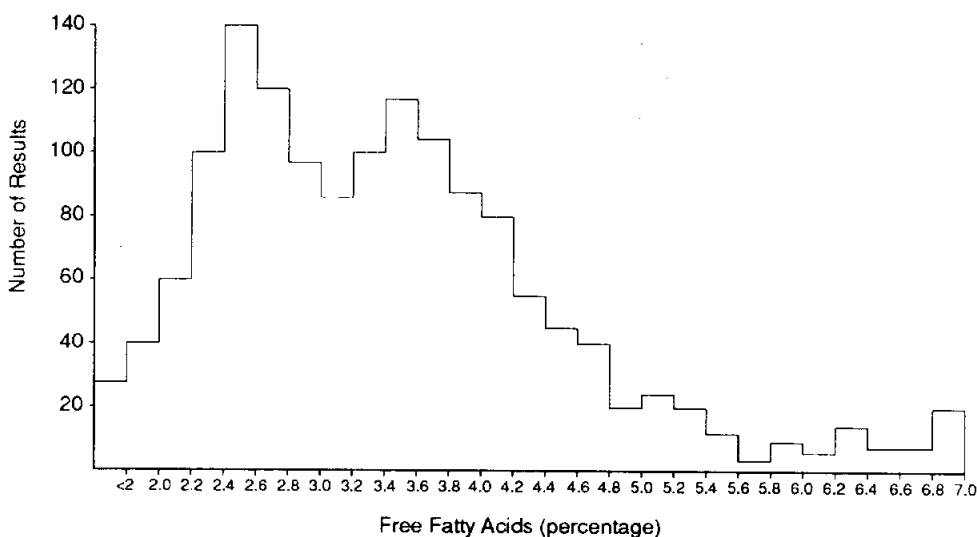


Figure 1. Percentage Free Fatty Acids in Palm Oil (results of 1500 analyses carried-out in Malaysia between 1949 and 1962)

had peroxide values between 4 and 6 meq/kilogram. In the 1987 survey, the peroxide values of crude oils received by refineries averaged 2.4 meq/kilogram, with 89% of the oils below 4.3 meq/kilogram.

Monitoring of the quality of oils from various mills is part of the industry's effort to keep oil quality to acceptable standards as well as to achieve new targets for the future. In this context, millers based on plantations are well equipped at their R&D centres to produce crude oils with low free fatty acid and peroxide values.

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