

## Review Article

**Palm fruit in traditional African food culture\***

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The centre of origin of the oil palm is the tropical rain forest region of West Africa. It is considered to be the 200-300 kilometre wide coastal belt between Liberia and Mayumbe. The oil palm tree has remained the 'tree of life' of Yoruba land as well as of other parts of southern West Africa to which it is indigenous. The Yoruba are adept at spinning philosophical and poetical proverbs around such ordinary things as hills, rivers, birds, animals and domestic tools. Hundreds of the traditional proverbs are still with us, and through them one can see the picture of the environment that contributed to the moulding of the thoughts of the people. Yoruba riddles or puzzles were also couched in terms of the environment and the solutions to them were also environmental items. They have a popular saying: A je eran je eran a kan egungun, a je egungun je egungun a tun kan eran: 'A piece of meat has an outer layer of flesh, an intermediate layer of bone and an inner layer of flesh. What is it? A palm fruit: it has an outer edible layer, the mesocarp; then a layer of shell, inedible, and the kernel inside, edible. The solution to this puzzle summarises the botanical and cultural characteristics of the palm fruit.

**Key Words: palm fruit, oil palm, palm kernel, vitamin A, traditional food culture****Introduction**

The centre of origin of the oil palm is the tropical rain forest region of West Africa. Chevalier<sup>1,2</sup> considers it to be the 200-300 kilometre wide coastal belt between Liberia and Mayumbe. The palm now spreads from 16°N in Senegal to 15°S in Angola and eastward to Zanzibar and the Malagasy Republic. However, the main oil palm belt of West Africa runs through the southern latitudes of Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon and into the equatorial region of the Democratic Republic of Congo (DRC) and Angola between latitudes 10°N and 10°S. Oil palm occurs naturally in the Semliki valley of the DRC-Uganda border, on the Ruzizi plains between Lakes Kivu and Tanzania, on the eastern shores of Lakes Tanganyika and the western shores of Lake Nyasa. Oil palm accompanied the slave trade to the New World (the Americas). It did not become established except in Brazil from the Ilha de Itaparica in the Bay of Salvador to the South Marau in the State of Bahia. Oil plantations have been developed in a number of places in Latin America since 1960.<sup>3</sup> Although, Malaysia is one of the major producers of the oil palm, the crop was introduced to that part of the world from West Africa, especially Nigeria.

The oil palm fruit is an oval-shaped drupe, 2.5 by 5cm, with a 2.5cm diameter. It consists of a thin, pliable exocarp, an orange/red pulpy mesocarp and a hard nut containing a single kernel. Oil palm fruits are borne tightly clustered in large bunches which may weigh from 5kg in young poor palms, to as much as 40kg in 15 year old palms in good condition. Three types of fruit can be recognized according to the thickness of the shell: (i) 'aura' with a shell thickness of 2-8mm; (ii) 'tenera' with a shell thickness of 0.5-3mm; and (iii) 'pisifera' without any shell.

**Oil palm production**

The oil palm gives the highest yield of oil per unit area of any crop and produces two distinct oils, palm oil and palm kernel oil, both of which are important in world trade. The international trade in palm oil began about the beginning of the nineteenth century, while that in palm kernels developed only after 1850. The trade in these products has been greatly extended during the last century. Palm oil is extracted in the producing countries, but kernels are usually shipped whole and the oil is extracted in the importing countries, although increasing quantities of palm kernel are likely to be extracted locally.

Palm oil is obtained from the fleshy mesocarp, which is 45-55 per cent oil by weight. The oil melts over a range of temperatures of 25-50°C. It is light yellow to orange red in colour, the depth of colour depending on the amount of carotenoids present, the amount of lipoxidases in bruised fruit stored for various periods before processing, and oxidation, catalysed by iron, during processing and bulking; for edible fat manufacture in Europe, the oil is bleached, but the bleachability of samples varies. Palm oil contains a high proportion of saturated palmitic acid, but it also contains considerable quantities of oleic and linoleic acid

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which give it a high unsaturated acid content compared to coconut and palm kernel oils. Poorly prepared palm oil has a high free fatty acid content caused by autocatalytic action, the action of lipase in unsterilized and bruised fruit, and microbial lipases; this renders it unsuitable for edible purposes in importing countries. Palm oil was widely used in the manufacture of soap and candles, and in the tinplate industry, but these uses are tending to decline; with the improvement in quality, it is being increasingly used for edible purposes, including the manufacture of margarine and compound cooking fats.

Palm kernel oil is obtained from the kernel endosperm, which contains about 50 per cent oil, the shell or endocarp having been removed. It is hard oil, closely resembling coconut oil with which it is readily interchangeable; it has a high proportion of saturated acids, predominantly lauric; it is solid at ambient temperatures in temperate countries, and is nearly colourless. It is used in edible fats, in the confectionery and bakery trades, in the preparation of ice cream and mayonnaise, and in the manufacture of toilet soaps, soap powders and detergents. The press cake, after the extraction of oil from the kernels, is an important livestock food.

Palm oil has long been an important article of diet in the palm belt of West Africa, as was reported by the early Portuguese explorers. In addition to supplying fat, it is also a rich source of carotene, particularly  $\beta$ -carotene, the richest precursor of vitamin A. Exports of palm oil from regions such as Eastern Nigeria are genuine surpluses after local requirements have been met and more is probably consumed locally than is exported. The palm kernels are not much used locally and are mainly exported. Clusius in 1605 reported that the fruits were used by the Portuguese to feed slaves when transporting them from West Africa to the New World.<sup>4</sup> He also records the use of the oil as an embrocation in São Thomé. The oil was known and sometimes prescribed medicinally in Europe at this time. With the suppression of the slave trade, palm oil replaced the traffic in slaves. Palm oil of crude manufacture was delivered to ships lying off coast. According to Hartwell,<sup>5</sup> the oil is used as liniment for indolent tumours. Reported to be anodyne, antidotal, aphrodisiac, diuretic and vulnerary, oil palm is a remedy for cancer, headaches and rheumatism.<sup>6</sup>

Palm wine is produced from the sap obtained by tapping the male inflorescence. The leaf subtending the immature male inflorescence is removed to provide access, the inflorescence is excised and thin slices are cut once or twice daily, the exuding sap being funneled by a piece of bamboo into a calabash or bottle. The fresh sap is sweet and cloying; it contains about 4.3g/100ml of sucrose and 3.4g/100ml of glucose; it ferments quickly by the action of bacteria and natural yeast to produce a more piquant drink, which has a milky flocculent appearance with a slight sulphurous odour. It is an important source of vitamin B complex in the diets of Eastern Nigeria and other parts of West Africa; it is produced in considerable quantity in the vicinity of towns and villages. A mean annual yield per hectare of 150 palms of 4000 litres has been recorded in Eastern Nigeria, and was estimated to have a value of more than double that of the oil and kernels from similar palms. Tapping reduces the yield of fruits. Tapping the crown of the tree laterally or felling the palm and drilling a whole through the growing point can also obtain sap; both these methods are very wasteful.

The central shoot or cabbage is edible. In West Africa, the leaves are used for thatching and the petioles and rachises for fencing and for protecting the tops of mud walls. The refuse after stripping the bunches is used for mulching and manuring; the ash after burning is sometimes used in soap making.

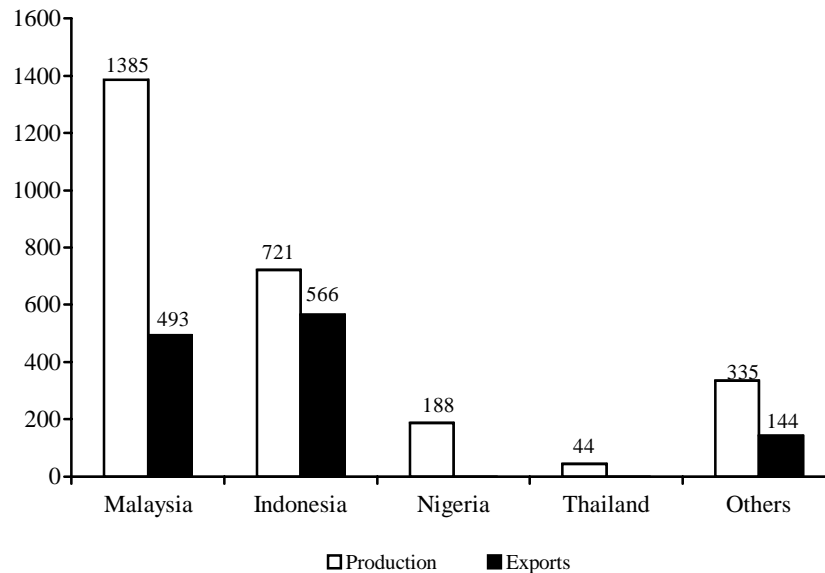
#### Oil palm trade

The establishment of the trade in palm oil was due to the industrial revolution in Europe and also as a replacement for the slave trade. As 'people began to take washing seriously', the oil was wanted for soap manufacture, and also for other industrial uses. In the 1830s, 11 000 – 14000 tons of palm were exported per annum from West Africa; by 1870, exports from Niger delta were 25000 – 30000 tons; in 1911, British West African territories exported over 87000 tons, valued at £1,900,000. The exports of palm kernel began in 1832. In 1911, British West Africa exported 157000 tons, valued at £3,400,000, of which about 75 per cent came from Nigeria. At this time, the demand for palm oil and kernel exceeded the supply, all of which came from wild and semiwild palms. The export of palm represented a surplus after the local

**Table 1.** Average annual exports of palm oil and palm kernels (thousand long tons)

	1909-13		1936-39		1946-49		1958-61		1962-65		1966-68	
	Oil	Kernels	Oil	Kernels	Oil	Kernels	Oil	Kernels	Oil	Kernels	Oil	Kernels
Nigeria	82	172	136	334	134	324	176	425	135	394	51	239
Congo (Kinshasa)	2	7	67	89	100	64	165	28	124	6	118	1
Sierra Leone and Ghana	9	47	2	82	2	69	-	62	-	57	-	38
Other African countries	29	91	42	156	28	138	36	198	42	154	33	79
Indonesia	-	-	202	42	35	10	113	33	108	31	139	30
Malaysia	-	-	46	8	39	5	87	22	121	15	203	33
Total	122	317	495	711	338	610	577	768	530	657	544	420

Source: CWS Hartely . The Oil Palm. London: Longman, 1967



**Figure 1.** PKO: Major producing and exporting countries. World total population = 2.67 million tonnes; world total exports = 1.20 million tonnes; Source: Oil World Statistics Update, 9.2.2001)

demand for culinary use had been met. Early in the twentieth century, Sir William Lever, later Lord Leverhulme, obtained large concessions of oil palm groves in the Belgian Congo, which in 1935 exported 56000 tons of palm oil and 64000 tons of palm kernels.

The first commercial plantings were made in Sumatra and Malaysia in the second decade of the twentieth century; by 1925, there were 78,123 acres in Sumatra and 19,079 acres in Malaysia; by 1938, these had risen to 228,100 acres and 72,143 acres respectively. Plantations were also made in the Belgian Congo. Nigeria, the largest exporter until 1934, took little part in the expanding world trade in palm oil, although West Africa maintained her position as the predominant exporter of palm kernels.

The Second World War stopped all exports from the Far East during the period 1942-46. Exports from French African territories fell to low levels; exports of palm oil continued during the war from Nigeria and Belgian Congo, but there was some curtailment in the shipment of kernels. Prices were low in 1930s, but after the war, they reached four to five times their pre-war level, thus making the production of palm oil and kernels an attractive proposition. Many large plantations were established in Malaysia and Belgian Congo. In Malaysia where there were only 78,000 acres of oil palms in 1940, planting continued and was expected to reach 1 million acres by 1973; this had been brought about by the need for agricultural diversification and increasing competition of synthetic rubber with the natural product.

Some planting has been done in Sabah. Indonesia failed to recover her supremacy in post war years due to internal political situation. Production of palm oil in Belgian Congo nearly doubled in the years following the war, but declined after 1960 due to internal disorders; they now have a very large palm-kernel crushing industry. There was an improvement in the quality and quantity of palm oil from the groves in Nigeria in the immediate post-war period, but there has been little development of

plantations; her pre-eminent position in the palm kernel trade has continued; internal strife is now bound to have curtailed her oil palm products. A new oil palm industry is beginning in Latin America and planting has taken place in Brazil, Colombia, Costa Rica, Ecuador, Honduras, Guatemala, Nicaragua, Panama, Southern Mexico and Venezuela. The Commonwealth Development Corporation began a large estate on the Guadalcanal Plains in the British Solomon Islands in 1971.

Exporters of oil palm products from the principal producing countries are given in Table 1 and Fig 1. The United Kingdom is the largest importer of oil palm products, importing annually during the period 1958-61 180,000 tons of palm oil and 243,000 tons of palm kernels, although there has been some decline in more recent years. West Germany, the Netherlands and France also import large quantities of these products. Imports into the United States are much smaller. Japan imports substantial quantities of palm oil and palm kernels. Eastern European and Middle East countries also import palm oil.

#### **The traditional preparation of palm oil in Nigeria**

Palms in the vicinity of the villages are individually owned, but palm in the bush are generally regarded as the common property of the village. Custom in this respect varies a good deal. A number of economically important by-products of the palm fruit are elaborated at the village level. These are illustrated in Table 2. It is to be noted that if the lard is made, the kernels are of no further use, and that if a palm-tree is fully bled for palm-wine, the quality of the palm kernel is affected.

The red oil (*main ja*) is obtained by boiling the nuts for a whole day, or by treading down the nuts in pits, kneading them, and drawing off the oil through a sieve. The residual sediment, which is left, is dried in the sun, fried and pounded. This expresses the black oil or *alayed* mentioned in Table 2.

**Table 2.** Economically – important by-products of palm oil, elaborated in traditional preparation in Nigeria.

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- a) The oily commodity known as *main ja*, “red oil,” obtained from the outer fleshy pulp of the nut
  - b) A coarse lard known as *alayedi* (used as an ointment of illuminant, and drunk as an aperient).
  - c) The illuminant known to the Yoruba as *gudubi*
  - d) Palm wine
  - e) The kernels exported to Europe
  - f) The broken nut-shells used by women for making girdles
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The number of heads produced by an oil-palm per year varies greatly, but the average may be put at five. The production of palm oil and palm kernels is in the hands of the domestic group. Interest in oil palm can be acquired by anybody through sale, lease or pledge. By means of a single or double climbing rope, depending on the locality, the men gather the fruits from oil palms that grow wild or in plantations. The children remove the nuts from the husks, and the women direct the extraction of the oil. Two methods are used: the soft oil and the hard oil process. In the soft oil process, the nuts are boiled in the water until they become tender. Then they are pounded by the men in a big mortar (*ikwe*), after which the women and the children separate the nuts from the fibres in a rectangular dugout called an *θgbó*. The fibres are then pressed over heated pieces of stone to stimulate the flow of oil. The resulting oil, now ready for sale, is stored in gourd containers or empty kerosene tins. In the hard oil process, the unboiled nuts are pounded. After water is poured over the pulp, the resulting surface is skimmed and then boiled. Finally the oil is drawn off. It is estimated that about 55 to 60 percent of the oil is recovered through the hard oil process while the soft oil process recovers about 50%. Nevertheless, the latter method is favoured because it yields better cooking oil which keeps longer, and as the result of containing less free fatty acid, commands a better price.

The Regional government encourages the use of hand presses. They have become increasingly accepted since World War II. Cheap hand presses giving a 65 per cent extraction are in common use but have been generally opposed by Ngwa women, who see in this innovation a threat to their traditional rights in kernels. The pioneer Oil Mills is even more efficient, giving about 85 percent extraction and a quality of oil with lowest free fatty acid. For palm fruits, the mills depend on plantations and open-market competition.

The women’s reward for their cooperation with the men in processing the oil palm fruit is their traditional right to the kernels; the men claim the oil if the fruits belong to them. To extract the kernels, the women and their dependants crush the nuts between stones. This is usually the main work during the raining season, when there is a short fall in farm tasks and trading is generally not very promising. At each market day, however, the need for cash is a strong incentive to extract the kernels. Women bring to the market their farm products, such as

wooden mortars, wooden ladles, hoes, knives, iron traps and cordage. European goods and smoked fish from the riverine areas are traded.

#### **Domestic food uses of palm oil in West Africa**

In nearly all palm-growing countries in West Africa, the red palm oil is an important food ingredient. The colour and taste from the oil of the traditional aura variety are generally more highly valued than those from the (hybrid) tenera variety. Also, the taste of the oil processed by traditional method is preferred. The crude (red) palm oil contains a high level of  $\beta$ -carotene and is an important source of vitamin A in the areas where it grows, preventing exophthalmia, that can cause blindness. Palm olein showed a tendency to cause a rise in the beneficial high-density lipoprotein (HDL) cholesterol and a decrease in the harmful low-density lipoprotein (LDL) cholesterol. These beneficial effects favour its use from the point of view of health.

In Benin, Cameroon and Nigeria, about 50% of the palm oil consumed is produced in the traditional way. In Ghana and Sierra Leone, it is even higher, about 70% and 90% respectively. Most of these traditionally produced oil varieties are only available in a certain season of the year, which leads to low market prices at harvest time and conversely to high prices out of season.

#### **Palm fruit and Yoruba culture**

The oil palm tree has remained the ‘tree of life’ of Yoruba land as well as of other parts of southern West Africa to which it is indigenous. Palm oil was the lubricant of the drilling tools, the thin iron punches. A different type of rounded bead (*ileke, lagidigba*) worn by women on the hip next to the body, was made from palm-nut shells. Palm oil was the favourite offering to many of the deities. The deity was consulted on every important step to be taken in life that involve the decisions or consequence, and on minor issues such as which land should be farmed, what crops would yield bumper harvest, how to prevent or cure a disease and so on. The Yoruba are adept at spinning philosophical and poetical proverbs around such ordinary things as hills, rivers, birds, animals and domestic tools. Hundreds of the traditional proverbs are still with us, and through them one can see the picture of the environment that contributed to the moulding of the thoughts of the people. For example, *Òrò púpò kò nkún agbòn*: “Many words do not fill a basket.” The proverb indicates that action is preferable to words as, through action, a farmer can fill a basket with yams, whereas these cannot be done with mere outpouring of words. The basket is woven with materials obtained from palm branches.

Yoruba riddles or puzzles were also couched in terms of the environment and the solutions to them were also environmental items. They have a popular saying: *A je leran je eran a kan egungun, a je egungun je egungun a tun kan eran*: ‘A piece of meat has an outer layer of flesh, an intermediate layer of bone and an inner layer of flesh. What is it? A palm fruit: it has an outer edible layer, the mesocarp; then a layer of shell, inedible, and the kernel inside, edible. The solution to this puzzle summarises the botanical and cultural characteristics of the palm fruit.’<sup>7</sup>

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