BABASSU OIL.

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Its Potentialities as a Competitor of Coco-nut Oil.

The import duties on oils and fats imposed by the United States of America have recently directed attention to babassu oil which is exempt from duty and carries no processing tax. Were it available in sufficient quantities to the American soapers and other consumers of oils and fats, the likelihood exists that babassu oil might quickly displace coco-nut oil in as much as coco-nut oil as well as most important oils and fats, including tallow, are subject to an excise duty of 3 cents or more.

For several years the soap industry has been aware of the existence of babassu oil as a potential raw material. The oil is obtained from the kernels of the nut of the palm *Orbignya Speciosa,* a subdivision of the family *Attalea,* which is very abundant in some parts of Brazil and represents one of the greatest sources of agricultural wealth in many regions of that country. It grows mainly in the States of Maranhao, Amazonas, Para, Piauhy, Ceara, Bahia, Espirito Santo, Sao Paulo, Minas Geraes, Goyas and Matto Grasso. It appears that no attempts have been made to cultivate the babassu palm elsewhere. It remains doubtful, however, whether the same results could be achieved with the fruit were it produced under different climatic and soil conditions. At the present time Brazil has forbidden, by decrees, the exportation of babassu trees and whole nuts, the object being of course to prevent planting and cultivation elsewhere. Commercial development has centered chiefly in Maranhao. It is estimated that there may be over 200,000,000 babassu trees in this State alone. It is possible that the tree may grow wild in other regions of Brazil.

The babassu kernel itself, from which the oil is obtained, is found in a nut which is made up of a pericarp, a fibrous material; mesocarp, which contains considerable tannin and starch; and endocarp, in which the kernel is embedded. The nuts are borne in bunches or "heads", each palm bearing from two to four of these heads twice a year. Each bunch contains 200 to 600 nuts, each nut containing two to six kernels, usually three or four. The kernels, which weigh about three grams each, make up about 15 per cent. of the weight of the nuts. The nuts themselves vary in size and the number which is required to make up a metric ton may range considerably, anywhere from 2,500 to 20,000 nuts being required. The nuts are extremely hard and require a pressure of from 10,000 to 25,000 lb. to burst them. They fall to the ground from June to the end of December, the exact period depending upon weather conditions.

Babassu kernels contain about 65 per cent. of oil, which is obtained in a manner similar to that employed in the preparation of other oils from palm kernels. The preparation of the oil is carried on almost wholly by natives. Attempts have been made to organize the industry but have not met with much success, and to-day the industry is practically just as it has been for years. The natives gather the fruits which have fallen to the ground, selecting the best nuts to give them the richest product. The de-kerneling is done mainly by hand labour performed by women and children who use hand axes. The kernels are very

much cut up when they are obtained by the primitive hand method, and decay sets in quickly, making the nuts mouldy and increasing the fatty acid content of the oil obtained from them.

For many years a great deal of effort has been put into the development of some mechanical means for de-kerneling babassu nuts. The nuts are so hard, however, that most attempts have been unsuccessful.

To obtain the oil, either pressing or extraction with solvents is practicable. When the oil is to be pressed, the kernels are ground, heated, and crushed in hydraulic presses. The press cake and meal generally have a protein content of 20 to 23 per cent. and are used for feeding stock.

Crude babassu oil, which is light amber in colour, is used for soap making. It is somewhat similar in chemical composition to coco-nut oil and palm kernel oil, but has a higher content of lauric acid than these oils. The lauric acid content makes the oil particularly valuable for soap making as it imparts a high saponification value and gives a soap which produces a profuse lather. It is refined to a pale yellow colour and sweet odour and in this condition makes a valuable edible product, taking the place of olive and coco-nut oils. It has been claimed that babassu oil is the best of the oils which can be obtained from many species of palm oil seeds. Babassu oil also has a very high value as a fuel for internal combustion motors of the diesel and semi-diesel type. Experts claim that it is superior to crude oil and even refined petroleum.

Germany used to be Brazil's best customer in babassu oil, purchasing as much as from 20,000 to 25,000 tons annually. Most of this oil was used for margarine manufacture. About 1927, however, when exchange difficulties began to be critical, Germany started to withdraw from the market. Holland and Belgium now buy some quantity of babassu oil and French soap-makers are using it in increasing amounts as a substitute for palm kernel oil. Babassu oil has been sold on a commercial scale in the United States for only the past two years.

The future consumption of babassu oil in America seems to hinge on the ease with which the oil can be made available in commercial quantities. This, in turn, rests on several factors among which is the devising of a machine to crack and handle the nuts in large quantities in some manner which will not break them up and injure the quality of the oil obtained. Another factor which stands in the way of progress in the direction of a great babassu industry is a satisfactory solution to the problem of whether the nuts should be cracked in Brazil and the kernels imported here for crushing, or whether the oil should be prepared in Brazil and shipped as such. The drawback in the first case is that the kernels having been carelessly obtained, are broken and decompose sooner than sound kernels.

At the present time the markets in the southern part of Brazil have been absorbing most of the production for home consumption. The development to be looked forward to in bringing back stocks in the United States is a saturation of these southern markets in Brazil. At the present time high costs almost preclude imports of babassu oil.

An interesting sidelight in the building up of the babassu industry lies in the value which is held to exist in the husk. This is supposed to break down into many valuable chemical substances when distilled and yield a residue of fine metallurgical coke. The complete husks make an excellent fuel, B.t.u. value of more than 50 per cent. that of good coal being claimed for them. As a matter of fact, the babassu nut first attracted universal interest in 1914 when the shortage of coal led to the

use of whole babassu nuts in boilers of Brazilian steamships. Brazilians, however, have long been aware of the versatility of this product and have used it in many ways as far back as they can remember. It has been used in the smoking of rubber in the Amazon Valley, excellent disinfectant value being claimed for the smoke as far as the animal life which exists in the rubber latex is concerned.

In addition to the value inherent in the husks of the nut, the babassu palm itself serves many purposes. The leaves are used as a roofing and thatching material and for making hats, baskets, and similar things. The sap of the tree is used as a food and for feeding stock. It is also a raw material for the manufacture of a type of sugar, the fibrous material, or pericarp, is used for making cord, brushes and mats. The mealy mesocarp is also used by the natives as a food, as well as a feed for cattle. The shell of the nut is made into articles for domestic use, such as buttons, and holds promise of being valuable for the manufacture of activated carbons. The trunk of the tree supplies building posts and the bunch stalks yield an excellent fertilizer after they have been allowed to rot. As a matter of fact, no part of this palm is wasted.

Exports of babassu nuts from Brazil since 1922 are given in tons in the following table:—

	Tons.		Tons.
1922	21,958	1929	8,700
1923	35,281	1930	12,296
1924	18,313	1931	14,212
1925	10,909	1932	8,917
1926	22,687	1933	623
1927	25,977	1934	217
1928	19,266	1935	9,966

The potential production of babassu oil is tremendous—probably much greater than coco-nut, but the present production is very small—so small that for some time to come babassu cannot make even a small dent in the demand for coco-nut oil. Nevertheless, among all the oils and fats, the potentialities of babassu stand out in the present situation.

NOTE.—Leo Schnurmacher Inc., brokers of the Manila Stock Exchange, in their *Review of Coco-nut Products* for 1936, made the following interesting remarks regarding babassu oil in the United States of America:—

> "After February, 1936, a main reason for the sluggishness in the oil market was attributed to the increasing importation into the United States of America of Brazilian babassu kernels, which give a substitute for coco-nut oil of satisfactory quality; the fact that under the terms of the commercial treaty concluded between the United States and Brazil, neither these kernels nor the oil expressed therefrom could be taxed, and reports about tremendous numbers of babassu palms existing in the primeval forests of the Amason Valley, evidently influenced buyers to take a waiting attitude. The scare proved to be rather exaggerated, as the extraction of the kernels from their extremely hard shells, increased the cost of production considerably, as do the primitive methods of harvesting and transportation to shipping points; besides, the bulk of the kernels is being consumed in the soap industry in Brazil, and the exportable surplus is not of a size to make considerable inroads into our coco-nut oil market likely."