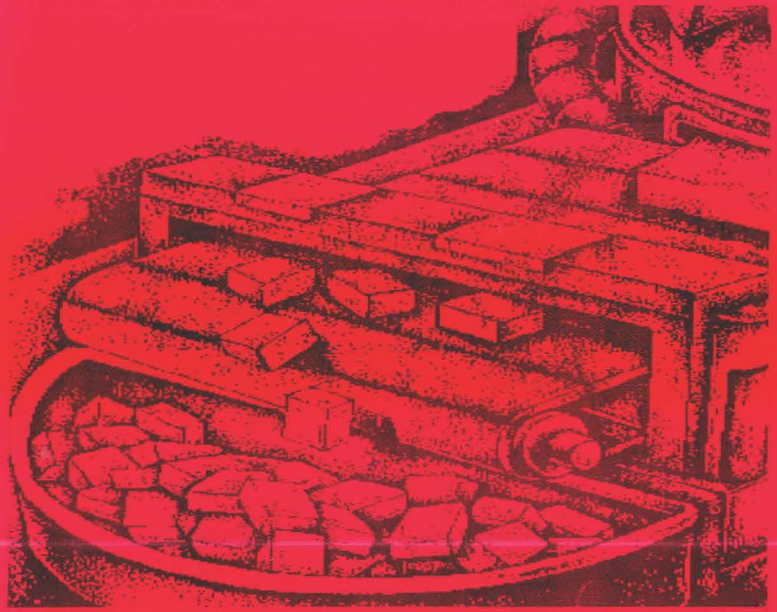

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NATA DE COCO

A Filipino Delicacy

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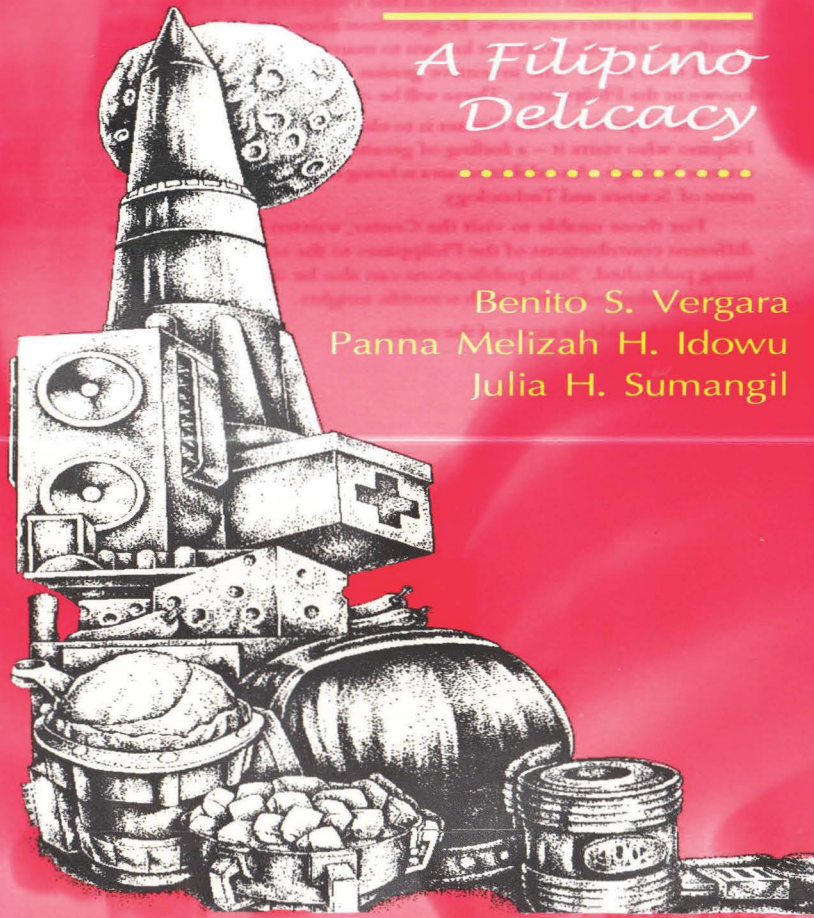


The Philippine Science Heritage Center is a project of the Philippine National Academy of Science and Technology. The Center highlights the important contributions of the Philippines to the world of science for a better tomorrow. In agriculture alone, the Philippines has significant contributions not known to many Filipinos that have affected their lives. The inventive genius of the Filipinos is hardly known in the Philippines. These will be collected and highlighted.

The objective of the Center is to elicit a sense of pride in every Filipino who visits it – a feeling of greatness in the richness of our science heritage. An exhibition area is being developed in the Department of Science and Technology.

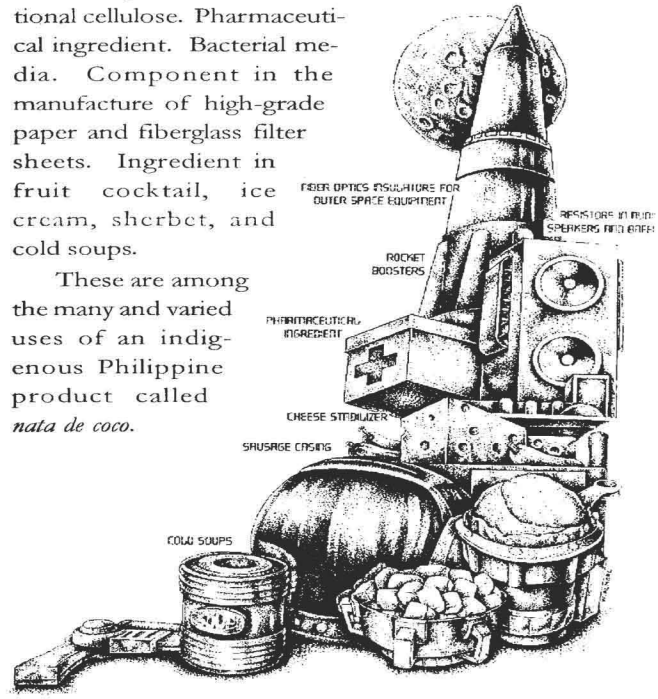
For those unable to visit the Center, written materials on the different contributions of the Philippines to the scientific world are being published. Such publications can also be used by schools in teaching values education with scientific insights.

This booklet is a part of the series.

Philippine Science Heritage Center
National Academy of Science and Technology, Philippines
Bicutan, Metro Manila
November 1999

Dessert sweets. High-cellulose diet food. Cheese and yoghurt stabilizer. Hotdog and sausage casing. Candy. Resistors in audio speakers and baffles. Food texturizer. Substitute for raw fish in sushi. Potential replacement for traditional cellulose. Pharmaceutical ingredient. Bacterial media. Component in the manufacture of high-grade paper and fiberglass filter sheets. Ingredient in fruit cocktail, ice cream, sherbet, and cold soups.

These are among the many and varied uses of an indigenous Philippine product called *nata de coco*.



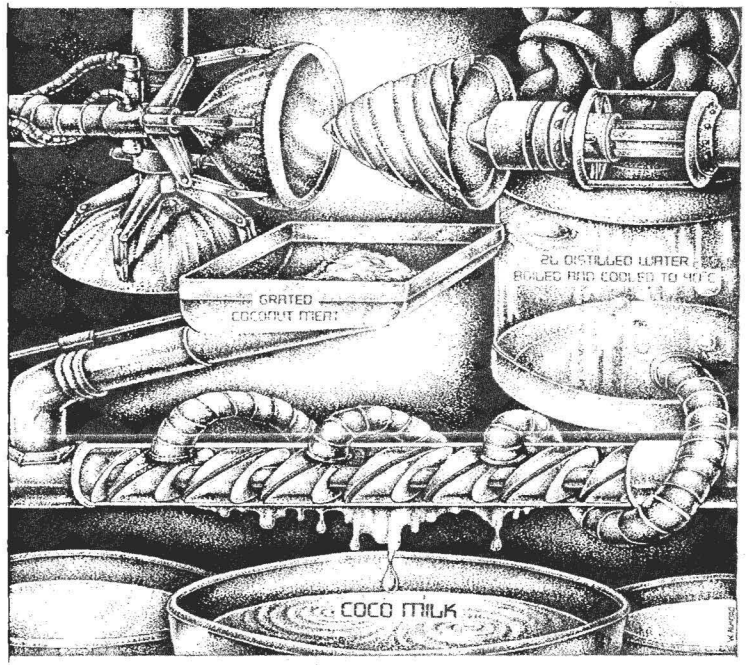
Floating, swimming, cream

The term "nata" is attributed to the Latin word *natare*, meaning "to float," and the Spanish word *nadar*, which means "to swim." It is also associated with another Spanish word that means "cream," literally making nata de coco the "cream of coconut water" — the topmost and best portion of it.

These terms reflect the nature of nata, because it is essentially the thick substance that floats on top of the coconut water mixture. The substance is gelatinous, and white or creamy-yellow to pinkish. It is composed basically of cellulose, water, and a small proportion of minerals.

More technically, it is the substance formed by *Acetobacter xylinum* on the surface of sugar-enriched coconut water, coconut milk, plant extracts, fruit juices, and other waste material. What these bacteria actually do is to feed on the sugar present in the coconut water mixture and, in the process of metabolizing it, produce thin threads of cellulose. These cellulose threads are formed outside the bacterial wall, and if allowed to grow in an unshaken container, they rise to the surface, forming a solid layer, what is commonly called nata. The end product contains about 96% water and 4% fiber.

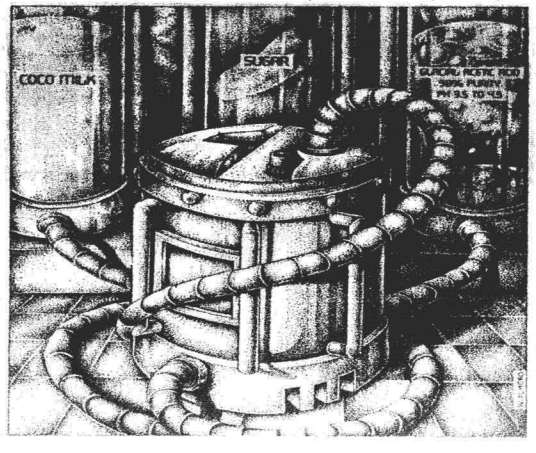
The growth of nata starts with the formation of a thin, slimy, transparent layer on the surface of the liquid. This gains in thickness and toughness after 7-10 days, forming a gelatinous sheet. It is then harvested" — removed from the solution, cleaned by scraping off the cream layer, soaked in water to remove the sour taste and smell, and cut into cubes. The nata is then ready to be sold to buyers or processors.

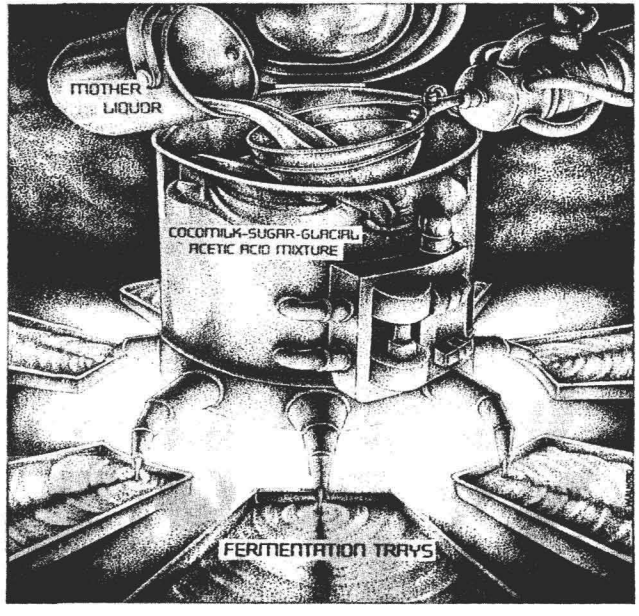


History

Nata production dates back to the 18th century. The town of Pagsanjan in the province of Laguna was known for its *piña* cloth. This material is made by weaving together the fine fibers extracted from pineapple leaves, hence its name. *Piña* cloth is used for making *barong tagalog* shirts and dresses and is the most expensive fabric used for this purpose.

Part of the process of making *piña* cloth is bleaching the material. In the 18th century, the bleach used was the acidic juice extracted from the parings of the pineapple fruit. The story goes that when some of the juice was left to rot, growth of a slimy substance on its surface was observed. Someone must have tasted it and found it good. Thus began the *nata de piña* industry.





This product became quite popular as a sweet/delicacy. However, due to the seasonality of pineapple, its production could not be sustained year-round. There was a need for a more regularly available medium.

In 1949, T.K. Africa, a chemist working for the National Coconut Corporation, published an article describing the use of coconut water as an alternative medium for nata.

In 1954, the Philippine Coconut Authority opened a branch in Alaminos, Laguna. Among the technologies introduced was nata de coco production. This was readily accepted because coconut was available the whole year round, and processing was easy compared with pineapple. Nata de coco production also became widely accepted in other provinces of the Southern Tagalog Region (Quezon, Batangas, and Cavite), which rank first in coconut production.

Improvements

The early nata producers used large, wide-mouthed glass jars as containers for the medium. The solution was allowed to stand for about 14 days — the length of time it would take for the nata to reach the desired consistency. By then, it would be very thick, almost half the height of the liquid in the jar. The reason it took so long for the nata to form properly was that the sugar content was too low and the acid concentration in the water not high enough.

By the mid-1970's, research by food microbiologists led by Priscilla C. Sanchez showed the optimum conditions for nata formation. Coconut milk (extracted from grated coconut meat) and water were a better medium when combined with glacial acetic acid and sugar. Over the years, adjustments in the proportions of the ingredients were made to ensure better quality nata.

Demand trends

Nata de coco is locally enjoyed all year round. It experiences an increase in demand around Christmastime and when there are fiestas or other

special occasions. It is also a popular food item abroad, greatly in demand in Japan, the United States, Taiwan, Hong Kong, the United Kingdom, Canada, and the Netherlands. In fact, the Philippines has been exporting nata de coco since 1977.

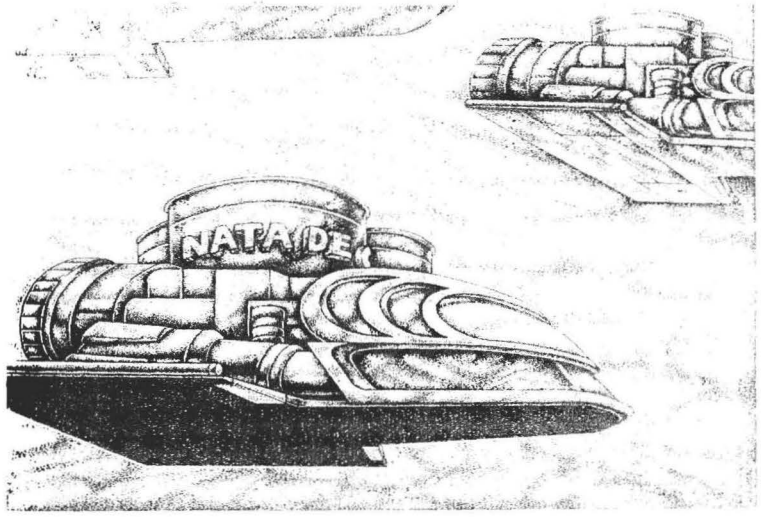
Around April 1993, Japanese television promoted it as some kind of a wonder health food that could supposedly prevent colon cancer. It was also recommended for pregnant and lactating women, as well as weight watchers. Because of such advertisements, the Japanese immediately stocked up on it, depleting supermarket supplies.

To cope with the sudden demand for nata de coco, Japanese businessmen went to their neighbor, the Philippines, long considered the leading coconut producer-exporter in the world.

Before long, Filipinos all over were responding to the call to produce more nata. From P200,000 worth of nata exports in 1986, the amount went up to P1 million in 1992 and to P25.8 million by the end of 1993.

White gold rush

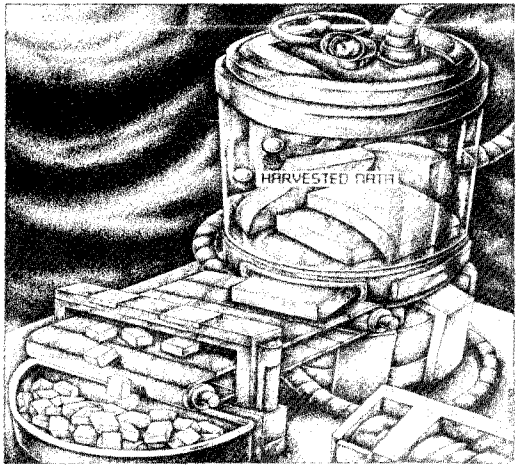
Nata de coco production suddenly became so widespread, it was as if a frenzy had struck the towns in Laguna and Batangas. In Los Baños, in particular, almost every household dipped into their savings to buy the necessary materials and equipment to set up their own nata production units. Every available space was utilized — extra rooms, sheds, garages, even living areas of homes were used to store shelves of plastic molders containing the medium that would yield the precious nata. No one was spared: housewives, children, students, professors, retirees, the unemployed, and household help. Everyone was drawn to this business, where inputs were relatively low and the benefits great. Some people even quit their regular jobs to concentrate on nata production full-time.



Many related businesses also experienced an increase in profit. Coconut vendors found themselves going directly to coconut farmers instead of the usual middlemen/traders, because the nuts would often be sold out even before they reached the market. Chemical companies ran out of glacial acetic acid,

and even wholesalers experienced shortages of sugar, the substance needed by the microorganism. Plastic molders and pails stacked higher than a person became a common sight in hardware stores, and the wooden paddles used in mixing the solutions abounded.

Banks were busy giving out loans to people who needed capital. There was great confidence in nata de coco because the return on investment was very short. Within 10 days, a producer would already have money in hand from the sale of raw nata. The rejected portions (sides, uneven cubes) could easily be used for home consumption or sold in public markets for a lower price. For a while, all was well.



Low quality

The life cycle or turn-around time for nata production is short, about 7-10 days. However, because of the desire to come up with greater amounts of nata to sell and also to have smaller amounts of rejects, some people added chemicals to the nata solution. Rumors circulated that some producers were using formalin to make the nata firmer and whiter and to prolong its shelf life. Suddenly, large shipments were being rejected and buyers were no longer showing up on designated pick-up days. Even some big companies producing nata were no longer able to sell their produce. The purity of Philippine nata had been questioned. In a global market where high quality is required and competition is keen, the Philippines suddenly lost out.

Food microbiologist Sanchez and newspaper columnist Fermin D. Adriano warned against the perils of taking shortcuts. They also emphasized the need for a quality standard that would regulate the production of nata. It was the only way we could compete globally. They cited the need to instill a certain pride in the product so that we would be able to sustain such income-generating industries in the future.

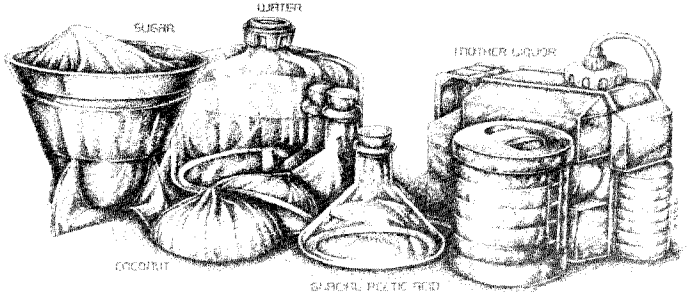
Today the Philippines is no longer the sole producer of nata de coco. It is now being produced in Malaysia, Thailand, Sri Lanka, Indonesia, and China. This indigenous Filipino technology has gained popularity among our Asian neighbors. However, because

there are many more possible uses for nata, we can still recapture what we lost.

New challenges

Recent articles on the phenomenal growth of the nata de coco industry say that nata can be fashioned into rocket boosters, super-strong plywood, faux filet mignon, cardboard boxes, canned soup thickening, art canvasses, surgical steel gloves, filters for purifying blood, bulletproof clothing, medical implants, super absorbents, surgical threads, and fiber optic insulators for outer space equipment. This is proof enough of the great potential of nata de coco. It is now up to Filipinos to pick up the remnants of their involvement and regain their foothold in the nata de coco market.

Nevertheless, we can take pride in the fact that this special dessert from the Philippines has gained worldwide prominence and acceptance.



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