

NEW APPROACHES

COCONUT PROCESSING IN THE TROPICS - DISCOVERY WITH PROMISE.

Findings of workers at the National Institute of Science and Technology in Manila lead to easy, low-cost treatment of kernels that decreases loss through spoilage.

BACKGROUND

COCONUT is an important food crop of tropical and semi-tropical regions of Asia, Africa and America, although it is usually classified as an oil-bearing crop in most producing countries. The acreage under cultivation is expanding so fast, and statistics are so inadequate, that most of the figures for production have proven to be under-estimates. The present world production may be estimated at over 100 billion nuts with fresh kernel weights ranging from below 200 to 600 grams each.

The Philippines is the largest single producer country. Annual production is approximately 10 billion nuts, some 95% of which is converted to copra. The crop provides either the entire livelihood or a large part of the income for more than 10 million people.

One of the few countries where a large part of the coconut production is used as human food is India. Elsewhere, coconut is chiefly converted to a dry product, the copra, which is marketed as a source of oil and cake.

THE PROBLEM

In the Philippines - and presumably elsewhere as well - production of copra entails losses of at least 10% of the coconut raw material through microbial spoilage. A further loss of 5-10% results from insect damage during storage and transport. Appalling conditions in the field, for which near-term remedies are not in sight, contribute greatly to those losses, and modifications designed to prevent them must be successful in the face of these adverse conditions. Also, since a low economic status is the rule for most producers of coconut, any effective treatment would have to require an absolute minimum of expenditure for materials and equipment.

THE ANSWER - A UNIQUE PROPERTY.

A unique property of coconut kernels and pieces that affords a means of treatment to prevent spoilage during drying was recently brought to light. The property was revealed by the recent studies of a group of workers at the Food and Nutrition Research Centre of the National Institute of Science and Technology in Manila (V.Subrahmanyam, I.C.Abdon, E.M.Payumo, D.T.Salon, V.A.Paterno, J.G.Palad, E.C.Eusebio and P.L.Maniquis).

Such spoilage during drying is greatly favoured by the uni-directional movement of water, together with dissolved sugars and other solutes, toward the surface. The kernel surface then becomes the most vulnerable part of the nut.

The discovery was made that the whole kernel, and also cut pieces of coconut, effectively resist penetration into the nut meat by a variety of water-soluble chemical applied as dips or sprays. The chemical substances remain chiefly at the surface, without effecting the quality of the oil or the protein from the nut meat.

Based on this property of non-penetration, momentary dipping in a 25% solution of sodium carbonate - or in a mixture of 7% acetic acid and 5% sulphuric acid was shown to be effective in protecting kernels or pieces of coconut against different forms of spoilage. The treatment using sodium carbonate solution was tried on a large scale in the sun drying areas of Mindanao island; complete control over infection was obtained, and yield of copra was increased by 10-20%. Trial shipments of treated copra were made to the United States, and the copra was processed. Oil recovered from the copra was found to be of high quality, with desirable light colour and low free fatty acids content (0.1-0.5%).

#### THE FRUITS & FUTURE.

The acid-treated product is very attractive in appearance; only a small residue of mineral acid remains at the surface. It has been processed into stable, edible coconut segments, or, after solvent extraction of oil, into protein-rich meal and flour. The flour already had found use, particularly as an ingredient in certain noodles.

Future coconut processing by the described pre-treatment and by drying in the harvest areas will be of great benefit to the individual producers and to the economies of their countries.

Similar treatments could be possible for other perishable food crop materials that possess the property of resistance to penetration by chemicals. Exploration of this approach is warranted to avoid the consequences of infection and the risk of mycotoxin development in food crops.

---

#### USDA SUMMARIZES COCONUT TRADING

WORLD EXPORTS OF both copra and coconut oil are estimated higher in 1966 than 1965, based on sharply increased movements from the Philippines. The Philippine Republic accounts for approximately 80% of the world exports of coconut products.

During the first half of 1966, exports of copra and coconut oil were nearly 40% above the ~~ixx~~ level for January-June 1965. United States imports are covered almost exclusively with Philippine goods. The first six months of 1966 saw an increase by 16% in imports of coconut oil, but also a decrease by 12% of purchases of Philippine copra, compared to the first-half period of 1965.

Higher prices (\$ 229/long ton) commanded as a result of 1965 decline in exportable supplies were topped by August 1966 (to \$ 185/ton) because of increased availability and the elimination of the 20% dollar retention scheme by the Central Bank in November 1965.