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A CASE FOR FOOD PROCESSING IN TRINIDAD AND TOBAGO

by

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INTRODUCTION

The preservation and storage of foods were important factors involved in the civilisation of man, and improvements in the technology of food preservation played no small part in the spread of civilisation.

At the present time, most countries are in the process of forcing industrialisation, and with it, is coming further urbanisation. As a result, people leave the food production areas and move to areas where industrial opportunities and possibilities of better life exist. Dislocation of population means that improved methods of production, storage and distribution are required to feed not only those in urban areas, but those withdrawing from farming, who were formerly producing their own food. Tied with this is the explosive increase in human population.

There are more people in the world today with adequate standards of living and they are demanding better quality goods. However there is also a large number of people in the world with inadequate standards of living. The standard of living varies directly with resources and technology, and inversely with population.

Many of the high quality foods in demand are also highly perishable, but these can be made stable and acceptable by the judicious application of present technology.

Commercial food preservation improves food supplies in other ways. It encourages and/or initiates intensive food production practices and reduces losses due to spoilage and decay in harvested foods. Together, these increase food supplies and eventually lower unit food costs.

In Trinidad and Tobago we have been faced with an inevitable pattern of the Agricultural trade in which we import approximately \$85 million (T & T) worth of food while exporting only \$70 million (T & T) worth of Agricultural produce consisting of mainly sugar (\$49 million T & T) and cacao, coffee and citrus (\$15 million T & T).

The history of Agriculture in Trinidad and Tobago has been largely the ups and downs of sugar and cacao. These two crops together with citrus and coffee account for 80 per cent of the island's agricultural production. With Governments orientated in their thinking towards export crops and the lack of proper marketing facilities, introduction of livestock and crops for local consumption have met with little success. This need for diversification of our Agriculture is most important and could be the key to our future success as an industrial society.

There is a great need for us to try and solve this large imbalance in respect to imported foodstuffs if we are to achieve a measure of independence. If the present rate of population growth (2.8 per cent per annum) continues to rise, and if world prices for our Export crops continue to fluctuate, we are faced with two major problems in Agriculture in Trinidad and Tobago.

- (1) We will have to increase production of our export crops and try to obtain as favourable a price for these crops, and
- (2) We will have to make tremendous advances in the production of locally consumed goods and particularly in livestock production.

The first of these two major problems could probably be solved by:-

- (a) the continued use or introduction of modern methods of mechanisation, and
- (b) more intensive research in respect to better varieties of plants, eradication of pests and diseases, use of the by-products, etc. Why should we need ten tons of cane to produce one ton of sugar while in Australia and Hawaii seven tons of cane will produce one ton of sugar? Why should bagasse, one of the by-products of the sugar industry be burnt as fuel when gas might be more economical and cleaner and the bagasse converted into hardboard, paper, furfural (used in nylon manufacture) and levulinic acid (used in plastics, pharmaceutical and food industries)?

To help solve some of these problems, the Tate and Lyle Central Agricultural Research Station, set up in 1959, has been carrying out both basis and applied research in all aspects of sugar cane growing. More of this type of research is needed.

The second major problem in Agriculture as stated above, if solved, would do much to alleviate the high import food bill, probably in the long run help to lower the cost of living and in both the short and long run, reduce unemployment to an unacceptable figure.

THE CASE FOR PROCESSING

In order to make advances in our production of locally consumed foods, the problems will have to be tackled from several fronts.

One of the solutions is the dire need for processing facilities in the country. There are several benefits to be derived from the introduction of these food processing facilities.

1. The farmers would have a guaranteed market for their produce. This would tend to stimulate production. It is noteworthy of the progress of the Poultry Industry with particular reference to "Broiler" production. This industry which started in Trinidad in the 1950's, where chicken were slaughtered at nine to twelve weeks of age, did not meet the local demand. In 1963, a processing plant was set up and an immediate increase in production resulted. This increase was so dramatic, despite the high cost of feed, that Government was able to impose restrictions on the importation of poultry in early 1964. Looking at Table 1, we can safely say that we are self sufficient in poultry production.

Table 1

Year	Imports of Poultry Meat (lb.)	Local Production (lb.)
1959	3.97 million	2.8 million
1961	5.98 "	7.6 "
1963	6.57 "	11.4 "
1964	4.46 "	15.6 "
1965	598,000 (Jan. to June)	24.0 " (estimated)

Another example of the response of farmers to a guaranteed market was in the production of Pigeon peas (Cajanus cajan) for the processing plant that was established in Trinidad. The crop is grown mainly by small holders, particularly in Tobago, so that the scope for future production is quite large. In the short space

of three years, since the establishment of the canning plant, production has increased threefold (Table 2).

Table 2

Year	Total Production of Pigeon peas (lb.)
1963	1,193,000
1964	1,445,000
1965	3,000,000

2. Some processing plants are labour intensive requiring fairly large numbers of unskilled and semi-unskilled labour. Meat processing plants and those involved in fruit and vegetable processing require large numbers of workers although they are mechanised to a high degree. We therefore benefit from a reduction in the unemployment level.

3. It is usual and perhaps desirable that the majority of green vegetables and fresh fruit should reach the consumer unprocessed. However, because these fruits and vegetables are harvested at different times of the year we obtain glut conditions of various products on the market for short times. We have then, an unbalanced situation with housewives not being able to obtain certain types of fruits and vegetables all year round. The farmer also suffers since he cannot expect to receive fair prices for his produce. Processed vegetables and fruits have become more acceptable to the present-day sophisticated consumer in Trinidad and Tobago, and a large quantity of these products is imported annually (Table 3). The establishment of processing plants would tend to regulate the market and prevent the seasonal gluts by freezing and canning supplies and by packaging in bulk containers for reprocessing in slack periods.

Table 3

Year 1964	lb.	Value \$ T & T
Imports of Processed and Fresh Vegetables	58,758,000	\$4,564,000
Local Production of green vegetables	26,600,000	\$2,750,000

4. With the establishment of food processing plants, better use can be made of the products because of the variety of forms in which they can be processed. This is quite evident in the processing of livestock where there is practically no waste. In fruit processing, lower quality fruit can be processed either as purees or fruit cocktails, etc.

5. The stimulation of subsidiary or related industries is the direct result of the availability of processing facilities. The offals of fish and livestock processing plants may be processed into livestock feed and fertiliser, while certain organs and glands can be utilised in the production of chemicals of great significance to mankind. Similarly the wastes from fruit and vegetable plants may be converted into important by-products. Processing first need materials of different types for the successful production of their products, so that industries involved in the manufacture of packaging material, metal and glass containers, labels, etc. would have to be established or expanded. Refrigeration, storage facilities, transport all have to be made available and to do this skilled and semi-skilled technicians have to be employed. This involves training of these persons, so that facilities have to be obtained, which results in a stimulation of the construction industry, the machinery industry both heavy and light and other allied trades. We see than that the whole economy benefits.

PROBLEMS INVOLVED IN ESTABLISHING PROCESSING PLANTS

Before we think in terms of processing plants we should realise some of the problems that face us in a country of our size and population. Some of these problems can be solved by the judicious use of the available machinery at Government's disposal. Others need the assistance of outside help. A few of these problems are stated below:

- (a) The consuming market, especially with regards to livestock production is very small so that outside markets would be necessary for the successful operation of such plants.
- (b) At the present moment we suffer from a lack of availability of raw materials for use in these processing plants. It is interesting to note, however, that Puerto Rico, despite its facilities for good processing and production, finds it necessary to import over 50 per cent of its raw materials for processing. Trinidad and Tobago would initially have to follow similar lines, but plans should be prepared whereby local food processors would be required to use all local materials available with phased replacements of imports by locally grown foods where-ever feasible.
- (c) Lack of a regulated guaranteed market for the farmer is a serious handicap in the production of larger quantities of local food crops.
- (d) Generally, there is a lack of technical "knowhow" amongst farmers in respect to food crops. They are more used to export crops such as sugar cane, cacao, bananas and citrus. This problem could possibly be solved by a larger staff of extension officers using more intelligent methods for the dissemination of technical advice.
- (e) In many of the field crops there is a lack of the right variety available to the farmers for planting. In food processing, not only must adequate supplies of raw materials be readily available, but they must be of the highest quality and suitable for processing. It is not generally realised, that not all varieties of fruit and vegetables can be successfully canned and frequently types have to be produced by growers for processing. One solution to this particular problem seems to be an intensive drive in research. Agricultural development must be preceded by research.
- (f) There are certain agronomic problems which call for more intensive and extensive effort. Problems such as the lack of suitable soils, insufficient irrigation water, high incidence of disease and many of the best soils being inaccessible, involve large expenditures, expert technical assistance and increased awareness that these problems exist.

PROSPECTS FOR FOOD PROCESSING

The solution to some of the above problems might appear insurmountable, but if tackled intelligently there should be hope for optimism. Some of the prospects for the food processing industry are:-

- (i) Size of Market. The size of the local market appears to be increasing about 3 per cent annually. The prospects of larger markets in the Latin America Free Trade Area and the Caribbean Economic Community look promising, but we will have to expect keen competition. We can continue to hope for preferential treatment in the Commonwealth market.
- (ii) Raw Materials. The limited raw materials that we possess can be augmented by importation as is done in Puerto Rico.
- (iii) Regulated Guaranteed Markets. The lack of these could be taken care of by the establishment of processing plants and the help of the Central Marketing Agency.

Listed below are some of the prospects for the processing of our agricultural products:-

- (a) The two main by-products of the Sugar Industry are bagasse and molasses. I referred to the possibilities of processing bagasse and from molasses several other products besides rum may be manufactured. These include Baker's and Food Yeast, Ethanol, Animal Feed Supplements and Citric Acid. In addition, Trinidad and Tobago import annually \$800,000 (T & T) worth of sugar confectionery and sugar based foods which could be produced locally.
- (b) Present annual imports of cocoa products amount to \$1 million (T & T) so that the possibilities of production of cocoa powder and chocolate syrups are real. In addition, a large part of our annual cacao crop could be exported in the semi-processed state as fat and powder instead of as beans.
- (c) Processing possibilities for the production of marmalade from citrus fruits, concentrates and powdered citrus juices are present.
- (d) The present local market for instant and soluble coffee is approximately \$1 million (T & T).

- (e) In the coconut industry we are faced at present with a shortage of fats and oils for local consumption. However, certain high cost products such as coconut milk and cream as a flavour for food products could be processed. This has been done quite successfully in Puerto Rico which has a very small coconut industry. Dessicated, shredded coconut enjoys a fair market in North America. There are also the possibilities for processing the coir fibre and shell into products with a lucrative market.
- (f) Although there is a ready market in the United Kingdom and other countries for some of our fruits such as mangoes and avocado pears, processing of these and others such as guavas and soursop into jams, jellies, purees and nectars could also help to expand our markets abroad. There are large areas in the Northern and Central Ranges suited to the production of the avocado pear and the mango grows easily in all soils in Trinidad. It is only a question of selecting and propagating the right varieties suitable for processing.
- (g) Attempts to rehabilitate the Banana Industry here have failed because of a lack of an assured market. An estimated 25,000 acres in the Northern Range immediately available are suited to the growing of bananas. The processing of this crop into purees, cereal foods, etc. would stimulate large scale production by the farmers.
- (h) Sufficient acreage exists in Trinidad suited to the cultivation of rice. With the establishment of a large mill centrally located and proper marketing facilities, there is every reason to believe that self-sufficiency is a distinct possibility in a country such as ours which produces 22 million pounds and imports 65 million pounds of rice annually.
- (i) The market for pineapple products is small (approximately 600,000 lb.) and production should be geared to an export market. There are some 50,000 acres well suited to pineapple cultivation and first crops are obtainable in Trinidad in eighteen months. The processing of pineapple into juices, cubes, rings and paste is a labour intensive operation and in Puerto Rico processors obtain yields of 15,000 tons of pineapples per year from 1,200 acres which makes the operation economically feasible.

- (j) The local fish catch for 1964 was valued at \$2 million (T & T) and importation of fish and fish preparations in the same year were approximately \$4 million (T & T). About 8,000 persons are employed in the fishing industry but the majority of boats are too small for deep sea fishing where more efficient methods would have to be employed for increasing the catch. Government's five year plan aims at increasing the annual catch to 20 million pounds. The establishing of processing plants producing fish products in a wide variety of ways for the consumer would be a stimulus to the industry. Fish could be processed fresh, canned, as fillets, fried and ready to eat, smoked, dried and salted. All these forms are acceptable to the Trinidad and Tobago consumer.
- (k) The market for milk in Trinidad is more assured than for any other agricultural product. Importation is in the range of \$13 million (T & T) for milk and milk products and future local demand should show a steep rise. The establishment of the Nestle milk processing plant guarantees the farmer a price based on the quality of his milk. It is estimated that 15 years would be needed in Trinidad and Tobago for self-sufficiency in dairy products to be achieved.
- (l) As has been stated before, the establishment of a meat processing plant would encourage the growth of livestock such as beef cattle, pigs, sheep and goats, with cheaper feeds and the increase in Pangola grass grazing, the prospects for a viable meat industry look promising.
- (m) There are in Trinidad by-products of some of our food industries which are available in commercial quantities which are at present going to waste. Some of these are cacao pods, pigeon pea shells, fish offals, spent grain (Carib Brewery), brewer's yeast (Angostura), citrus meal, molasses and rice husks. The Regional Research Centre of the University of the West Indies has experimentally prepared about twenty samples of animal feeds produced from both these by-products and locally occurring legumes. Chemical analyses of these products indicated a high protein content so that the production of animal feeds from local raw materials appears feasible.

Some of the possible solutions to the problem of self-sufficiency in Trinidad and Tobago could possibly be:-

- (1) The establishment of a meat-packing plant enabling farmers to obtain a guaranteed market for their livestock.
 - (2) The need for maximum encouragement in the setting up of food processing plants capable of processing a wide variety of products but on a scale having reference to the available market. It is hoped that private investors could be encouraged in the establishment of these plants.
 - (3) The establishment of a Bureau of Standards so that quality products would be a goal of the industry, ensuring a high percentage of the local market and an expansion of foreign markets. We need to have known published standards so that the public is aware that local manufacturers are producing to these standards. It is only in this way that prejudice against locally manufactured goods can be overcome, which would result in greater sales of locally manufactured goods.
 - (4) The early establishment of a Food Technology laboratory. In Trinidad and Tobago food processing has been solely in the hands of private enterprise, with resulting products whose quality in some cases does not compare favourably with similar products produced abroad. When new products are contemplated for processing and introduction into any market, efficient methods of manufacture of a high quality product, quality control of both the raw material and the final product, shelf-life and consumer acceptance all have to be taken into account. This is where the Food Technology laboratory would be of great use. An establishment of this nature should consist of:-
 - (i) The main laboratory housing microbiology and chemistry laboratories, testing booths and an experimental kitchen.
 - (ii) A pilot plant flexible in design and layout to process a wide variety of products.
 - (iii) Cold storage facilities and special rooms with the necessary facilities for study of fruits and vegetables under various ambient conditions.
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The main objectives in the establishment of a Food Technology laboratory should be:-

1. To develop methods for the processing of locally produced products so as to provide an outlet for the bulk of these products.
2. To provide the food processing industry with technical information both in respect to actual food processing and consumer acceptance of new products.
3. To provide a quality control laboratory for the local food processors.
- and 4. To develop new products from local raw material.

These are some of the factors responsible for the optimism which the author feels exists in the food processing industry.

The dominant objective of Government's five year Agricultural Development Programme (1964-68) is aimed at "reducing the share of imports in total food consumption in order to achieve a greater degree of self-sufficiency and to protect the Balance of payments." If a variety of local crops not now grown and marketed in an organised way, or with any assurance of a remunerative outlet, can be developed and brought under orderly processes of production and disposal, much benefit for the farmer and the country's economy may be visualised. Food processing can be the answer to this problem.