



Postharvest Institute for Perishables

MARKETING SURVEY OF THAI PROCESSED FRUITS AND VEGETABLES

by

Harvey C. Neese
and
Donald S. Leeper
Agri-Food Systems International, Inc.

for the
Postharvest Institute for Perishables

GTS Report No.
PIP/Thailand/Nov. 82/No. 14

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University of Idaho

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I. EXECUTIVE SUMMARY

The objective of the study was to investigate and assess the export market development potential for 14 selected processed fruits and vegetables produced in Thailand and marketed to four countries: the United States, Japan, Hong Kong, and Singapore. Two additional commodities were investigated, primarily in the U.S. Pineapples were not included since there is already a well-established export industry.

The U.S. market potential was of primary interest. Forms of processing considered were canned/bottled, frozen, dried, juiced and pickled. Consumer, institutional and manufacturing markets were investigated.

The initial phase of the study involved current demand for the study commodities in each of the four target countries, assessment of competitive considerations and selection of those commodities offering substantial development opportunities for Thai firms.

In the second phase, marketing channels for the products, import and market factors and pricing for the selected commodities were investigated. Prospective, interested purchasers were identified and their requirements defined.

The last phase entailed recommendations for an integrated, export market development program.

This study was conceived as a first step in the establishment of an effective export program for processed commodities. Its scope was limited to identification of opportunities and market requirements.

To capitalize on market opportunities, Thai processors/exporters will have to supply commodities that satisfy buyer requirements on a reliable, competitive basis. Adequate raw products of most fruits and vegetables for processing is a major problem in Thailand. A reliable supply of quality commodities for processing will need to be established. These two important elements of the export system will have to be addressed in order to have an effective development program.

An independent investigation of Thai production and processing capabilities was beyond the scope of the study. However prior work by Agri-Food Systems in Thailand, a review of available relevant studies and statistics and a limited number of interviews of Thai processors/exporters

indicated that all commodities selected for consideration are produced and processed in Thailand to some degree. Some commodities may be difficult to produce in sufficient quality and quantities needed for a viable export market.

In each of the markets being investigated, available studies, import and other statistical data were analyzed. Primary emphasis in performance of the study was on securing the advice and opinions of individuals and organizations directly involved in importing, distributing and marketing of the commodities.

U.S. Market. Principal marketing channels for Thai processors/exporters are general or specialized importers/wholesalers serving consumer or institutional markets, national supermarket chains and manufacturers. Consulted during the course of the study were supermarket chains with over 5,000 stores, 14 importers/wholesalers serving consumer markets and six serving the institutional trade, three dried tropical fruit importers and nine manufacturers.

Commodities found to have substantial U.S. market development potential were:

- 1) Guava, Mango and Papaya Purees. These products are for the manufacture of fruit nectar drinks. Preferred form of processing is aseptic packaging but frozen is acceptable. Three interested prospective buyers with annual requirements in excess of 3,800,000 lbs. were identified.
- 2) Dried Papaya and Pineapple Rings. Two interested importers/wholesalers with requirements of over 2,500,000 lbs. annually were identified; a major supermarket chain with annual requirements of over 4,000,000 lbs. is interested in direct imports.
- 3) Processed White and All-green Asparagus. Annual demand for canned white asparagus is estimated to exceed 4,000,000 lbs., all imported. Taiwan is the principal supplier. U.S. demand for canned all-green asparagus was 68,256,000 lbs. in 1981; for frozen 11,289,000 lbs., currently supplied by U.S. processors. Asparagus production costs and retail prices are high relative to those for other vegetable

crops. Asparagus canning is becoming unprofitable for processors in the U.S. and the industry is shrinking. Consensus of those interviewed was that all-green asparagus production and processing is likely to migrate to countries with lower production costs, following the same pattern, and for the same reasons, as white asparagus did several decades ago.

Three interested importers/wholesalers of canned white asparagus serving consumer and institutional markets with annual requirements of over 1,000,000 lbs. were identified. The following firms are interested in considering imports of canned all-green asparagus; a major supermarket chain, and a large wholesaler of canned all-green asparagus and two importers/wholesalers. One importer serving the institutional trade, with annual requirements of about 2,000,000 lbs., expressed an interest in importing frozen, all-green asparagus.

- 4) Canned Gourmet/Oriental Specialties: Water Chestnuts, Bamboo Shoots, Baby Corn. These products were considered together because prospective buyers normally handle all three. A number buy mixed containers of two or three of the products. Availability of all three products in a source country will be a significant marketing factor. Market demand for consumer-pack, canned water chestnuts exceeds 12,000,000 lbs. per year in the U.S.; institutional and manufacturing demand is substantial. Estimated demand for consumer-pack canned bamboo shoots is 6,000,000 lbs. a year. The demand for canned baby corn is substantially less than those for water chestnuts or bamboo shoots with little being used for manufacturing.

Interested prospective purchasers identified were: the largest U.S. manufacturer of oriental foods with annual requirements of over 1.5 million lbs. of water chestnuts and 1.4 million lbs. of bamboo shoots; four importers/wholesalers with estimated requirements for 7.4 million lbs. of water chestnuts, 3.1 million lbs. of bamboo shoots and 280,000 lbs. of baby corn a year.

U.S. Market Development. The following considerations will be important

for successful development of U.S. markets by Thai processors/exporters. Exporters will normally have to initiate trading relationships with potential U.S. buyers. A U.S.-based market development strategy to identify buyers, establish commercial relationships and liaise with buyers will be most effective. Quantity, quality packaging and other product requirements of purchasers must be initially satisfied and maintained; pricing must be competitive, delivery commitments must be met and Thai firms must prove reliability. Processor, private labeling will be an important feature of marketing some products, particularly consumer-packs. The ability to provide high quality labels is most important.

Japanese Market Development. Main marketing channels for processed fruits and vegetables for Thai exporters are import and trading companies, importers/wholesalers, large department stores and manufacturers.

The following commodities were found to have substantial market development potential:

- 1) Dried Bamboo Shoots. Domestic demand is approximately 4 million kgs., most imported.
- 2) Canned Bamboo Shoots. Annual demand exceeds 80 million kgs. In 1981, 26 million kgs. were imported, primarily from Taiwan with Thailand supplying only 600,000 kgs. Average CIF prices for the Taiwan product were Y189/kg. and for the Thai product Y104/kg. There is an opportunity for Thai exporters not only to increase their share of the market but also increase prices and returns.
- 3) Canned Mixed Tropical Fruit, Fruit Salad and Cocktail. In 1981, Japan imported about 5 million kgs. of mixed fruit products, including both temperate zone and tropical varieties. At least 750,000 kgs. of tropical products were imported; Thailand only supplied 8% of that quantity.
- 4) Canned Baby Corn. Principal market is the institutional trade. Annual demand is in excess of 1.5 million kgs., mostly imported. In 1981, Thailand supplied 20% of the imports of this product.

Five importers, each handling a wide range of food commodities including the study commodities, were identified as interested potential purchasers. For competitive reasons, they declined to estimate their requirements for study commodities or provide current competitive prices. Japanese importers prefer to disclose these and their product specifications and packaging only to suppliers.

In contrast to normal U.S. practice, it is common for prospective Japanese buyers to seek out new suppliers and consult with trade development organizations. The objective of Japanese firms is the establishment of a continuing, long-term trading relationship. They work closely with processors and will often assist in establishment of a supply of fruits and vegetables for processing, if it is a problem. The Japanese market has high product and label quality standards. Most imported processed food products are private-labeled by suppliers, but with established brands owned by importers or those organizations they represent.

Hong Kong Market. Principal marketing channels are supermarket chains, importers supplying smaller wholesalers, other retail stores, institutions, provisioning ships and importers who reexport. Processed fruits and vegetables are imported and there is little local manufacture. Ship manufacturing and reexport are substantial markets.

Processed commodities found to have substantial market development potential for Thai exporters were:

- 1) Canned Bamboo Shoots. Hong Kong imported over 2.8 million kgs. in 1981, primarily from China. Thailand supplied 13%.
- 2) Canned Baby Corn. 1981 imports exceeded 3.5 million kgs., primarily from Taiwan. Thailand supplied none.
- 3) Canned Asparagus. Hong Kong imported about 7.7 million kgs. in 1981, mostly supplied by Taiwan. White and all-green asparagus are not separately reported.
- 4) Cashews. During the first 8 months of 1982, 5.6 million kgs. were imported. The form of product imported, whether shelled or unshelled, raw or roasted, is not specified. The market is highly

competitive with Thailand supplying 30%. There is a substantial difference in CIF prices received from China and India which supply 21% (HK \$27-33/kg.) and Thailand (HK \$4.58/kg.). Reasons for the differential were found to be the limited processing and quality (broken pieces) of the Thai product. There appears to be only limited opportunity for Thailand to increase its share of the Hong Kong market but a significant possibility to increase prices received by further processing and improvement in quality.

Thailand is the principal supplier of a wide variety of fresh fruits to Hong Kong. Maintenance and improvement of the Thailand position in the supply of fresh fruit should have a first priority in Thailand's export marketing program; development of markets for processed commodities should not be emphasized at the expense of fresh exports.

Three interested, prospective purchasers supplying the domestic Hong Kong and reexport markets were identified. Supplier reliability, maintenance of product quality and competitive pricing will be important factors for development of Hong Kong markets.

Singapore Market. Marketing channels for Thai exporters are essentially the same as those for Hong Kong. In addition, there is substantial manufacturing in Singapore. Larger manufacturers import directly. Ship provisioning and reexport is substantial.

There is no significant production of fruits and vegetables in the country; fresh and processed commodities are mostly imported. The established relationship between Singapore and the Malaysian Peninsula, which produces many of the same products grown in Thailand, is an important marketing advantage. The close location of Thailand should offer a competitive advantage however, over other countries such as Taiwan and China.

Processed commodities found to have substantial development potential were:

- 1) Canned Lichees. In 1981, Singapore imported over 10 million kgs., reexporting 25% to Southeast Asian markets. Substantial quantities of fresh lichees are also imported. The almost exclusive supplier of both the canned and fresh product is Taiwan.

- 2) Canned Longans. Imports were about 4 million kgs. in 1981, an increase of 13% over the prior year. Significant volumes of fresh longans are imported, which declined 23% in 1981 from 1980. Taiwan supplied about 90% of the canned product and Thailand a small quantity. Thailand is the principal supplier of the fresh product.
- 3) Dried Bamboo Shoots. The volume imported in 1981 was relatively small, 111,980 kgs., but this represented a 25% increase over 1980. Thailand supplied over 50%, China 32%, and Taiwan 15%. There was a substantial differential in CIF prices received by China (S \$12.48/kg.) and Thailand (S \$1.17/kg.). The reason was poor quality of the Thai product due to inadequate processing. While there is not much opportunity for Thai exporters to increase their share of the Singapore market, there is a substantial opportunity to increase prices by improving product quality.
- 4) Canned Straw Mushrooms. Singapore imported nearly 1 million kgs. in 1981; exporting about 140,000 kgs. Taiwan supplied 88%.
- 5) Cashews. In 1981, Singapore imported over 800,000 kgs., a 78% increase over the previous year and reexported 81%. The market is highly competitive. Principal suppliers were India (41%), China (22%), and Brazil (18%). Thailand supplied only 2%. CIF prices received by India was S \$15.34/kg., China S \$11.62/kg., and Thailand S \$4.28/kg. There is an opportunity for Thai exporters to not only increase their share of the market, but also, as in Hong Kong, to increase prices they receive with improvement in product quality.

Three interested prospective buyers serving the domestic and reexport markets for study commodities were identified. Singapore's domestic and reexport markets are highly competitive. In general, purchasers were unwilling to specify their requirements, current pricing, and other requirements, preferring to discuss such matters directly with suppliers. One important point made, however, was that Singapore consumers are "brand-conscious" and for successful marketing, products will have to be presented under established labels.

Singapore importers are well-acquainted with Thai processors and exporters, more so than those in the other markets investigated. The consensus was that the quality and processing of Thai products was adequate for the market but pricing is not competitive with other countries such as Taiwan.

Thai pineapple product exporters are regarded as reliable suppliers but Thai suppliers of other processed commodities do not have the same reputations. These problems will have to be addressed for successful development of Singapore opportunities of Thai products.

Summary of Recommendations

Recommendations with respect to specific markets are outlined above. Those for the integrated market development program are as follows:

Processors/exporters will necessarily be involved in all aspects of the program. Catalogs of Thai processor capabilities and products available should be prepared and distributed regularly to prospective purchasers overseas. An annual food processors' trade fair should be held in Bangkok. Exporters should have their own promotional materials available for prospective purchasers, respond promptly to buyer inquiries and demonstrate reliability with due performance of sales contracts.

Product quality standards should be established and maintained. A food processors association should have an effective enforcement mechanism to assure compliance of exporters. Food processors should institute cost reduction programs in order to become more competitive in export markets.

The Thai Government, in addition to providing appropriate assistance as proposed above, should perform several investigations prior to any promotion of export marketing of commodities. These are: an in-depth investigation of capacities, capabilities and needs of processors for developing a program for remedying deficiencies; a survey of the production and available supply of crops for processing and the design of a program which will assure a reliable, adequate supply of crops of necessary quality for processor exports.

Packaging and label improvements to bring Thai packaging up to international standards is a necessary part of market expansion for processed foods.

Thai processors will have to be price-competitive in export markets. Taxes, governmental regulations, cumbersome export procedures and inefficient export facilities can make it more difficult for them to be competitive. Import tariffs and regulations on processing inputs can also contribute. These should be reviewed, and changed as appropriate, for an effective export market development program. Knowledge of current, competitive commodity pricing in export markets and food processing trends in principal competitive supplier countries will be important for processors. The RTG should establish a system for collection and dissemination of this information to processors on a timely basis.

The recommended primary role of AID should be assistance with expert advice, and technology and technical assistance to the RTG for performance of necessary surveys, investigations and joint venture possibilities. Consideration of necessary funding support might be appropriate but was outside the scope of this study. If investigation shows that processor facility expansion or improvement in export facilities is needed, AID might consider assistance for these purposes.

It is proposed that AID pursue two further marketing surveys in connection with the expansion of the Thai fruit and vegetable export market development program.

The first survey is supplemental to this one, an investigation of development potential for selected commodities in other market areas, such as Europe and the Middle East.

The second survey is similar to this one but would encompass exports of fresh fruits and vegetables to Asian markets--fresh and processed exports are closely related. Although Thailand exporters are presently exporting sizable amounts of fresh fruits to some Asian markets, it is felt that these could be increased considerably with new marketing innovations such as improved packaging and a more efficient delivery system.

II. INTRODUCTION

The Agency for International Development (AID) has contracted with the Postharvest Institute for Perishables (PIP) at the University of Idaho, to complete a marketing survey of Thai-processed fruits and vegetables. PIP subsequently subcontracted with Agri-Food Systems International, Inc. to conduct the survey.

Under the Private Sector in Development Project to be authorized in FY 1982, the United States, through its AID Mission in Bangkok may assist the Royal Thai Government (RTG) to promote the production, processing and marketing of Thai-produced fruits and vegetables. This survey is to assist AID to assess the market prospects of various fruits and vegetables and identify the products with the best market potential prior to any promotional activities by AID with the RTG.

Objectives

The objectives of this survey are given as follows:

1. Identify at least five Thai-produced processed fruit and vegetable products which have substantial market potential in one or more of the following markets, in sequential order of importance -- a) U.S., b) Hong Kong and Singapore, c) Japan, d) Thailand;

2. Secure an in-depth understanding of the markets in order to win market acceptance for the identified products, including consideration of the following factors: size of demand, form of processing, pricing, current and prospective suppliers, grade and quality, packaging, volume, and frequency of deliveries, seasonality, supplier reliability, other competitive considerations, financing, methods and costs of shipping, etc.

3. Establish maximum production costs, target export prices, or price ranges, for each of the selected products in each market which Thai suppliers will have to meet or beat in order to gain entry into that market and maintain a market position. These prices will be estimated by taking the market price data developed in the survey and subtracting estimated shipping costs and import costs from Bangkok;

4. Develop recommendations as to how Thai suppliers can best enter and maintain participation in the identified markets and what AID might do to assist the suppliers. Channels of marketing and present and foreseeable competitive considerations will be investigated; specific potential buyers are to be identified.

An investigation and analysis of production and processing factors and costs was not within the scope of work of this survey. Nor was the determination of profitability of commodities for Thai processors.

An in-depth understanding of a few products was desired rather than a general market survey of a large number of products. Forms of processing considered were canned/bottled, frozen, juiced or dried. Emphasis of the survey was on supplying a current, existing, developed market demand rather than on creation of a market demand for products which are not currently traded in the market areas being considered.

Products

A list of products was developed by the Thai Department of Commercial Relations in the Ministry of Commerce and forwarded by AID to AFSI through the Postharvest Institute for Perishables.

The list of products are as follows:

<u>Fruits</u>	<u>Vegetables</u>	<u>Nuts</u>
Rambutans	Young corn	Cashews
Rambutan with pineapple	Mushrooms	
Longans	Bamboo shoots	
Lichees	Cowpeas	
Mangoes	Sugar peas	
Papayas	Asparagus	
Mixed fruit cocktail		

In addition, the market development potential was considered for guavas and water chestnuts, primarily in the U.S.

Conduct of the Work

Two AFSI personnel, Harvey C. Neese and Donald S. Leeper, had responsibility for conducting the survey. In addition, limited assistance was obtained from the use of local individuals who were contracted in two of the countries surveyed.

After execution of the subcontract with the Postharvest Institute for Perishables and before commencement of field work, AFSI reviewed available studies and information pertaining to production and processing of commodities listed in Thailand. AFSI and the AID Contract Officer agreed that the commodities and forms of processing mentioned above would be considered. Types of markets to be investigated were consumer, institutional and manufacturing. It was recognized that particular commodities would have differing development potentials in the various markets.

Primary sources of information, data and opinions upon which conclusions and assessment of development potential are based were interviews of organizations actually engaged in food imports; manufacture, distribution and marketing in the four markets involved. Approximately two-thirds of allotted project days were spent interviewing such organizations. Relevant reports, studies and government statistics were analyzed as well.

Data availability and willingness of business firms to provide specific information with respect to their interests varied by country. In the U.S. market information is available and those interviewed were, in most instances, cooperative in providing specifics on their interests, requirements, pricing, etc. Market data and analysis available for Japan and Thailand were adequate for the purposes of the study, but information with respect to Hong Kong and Singapore was much more limited. Because of a perceived potential competitive disadvantage, business firms in Japan, Hong Kong and Singapore were reluctant to provide details in initial contacts with respect to their interests and requirements.

Competitive prices (target prices) are presented in the study either on a CIF market or FOB supplier country basis, whichever basis prospective buyers indicated as being their preference and customary purchasing practice. Thai exporters are accustomed to quoting on either basis. Shipping insurance and freight costs are negotiable between the shipper and carrier. They change frequently and can vary to a considerable degree dependent on the type of commodity; the shipper and volume of cargo business; the carrier; the point of shipment and destination; frequency of carrier service and ports of call; demand for shipping space and fuel and other vessel operating costs. A general estimate of shipping costs to be applied for the conversion of CIF to FOB prices of a range of products will be of little validity, and is even likely to prove misleading for some commodities if the FOB price were to be used as the basis for further program development. Exporters interested in particular commodities can readily calculate FOB prices by deducting their currently quoted insurance and freight costs from the CIF prices given.

Prices are presented in the currency of the market country. Conversion rates can vary on a daily basis. The quoted rate of exchange on the currencies involved versus the U.S. dollar on March 28, 1983, in the Wall Street Journal was:

	<u>Equals U.S. \$1.00</u>
Japan	Y239.75 (Yen)
Hong Kong	HK \$6.73 (Hong Kong dollar)
Singapore	S \$2.09 (Singapore dollar)
Thailand	B 23.00 (Baht)

Weight measures reported are those commonly used in the market countries involved, either pounds and tons (2,000 lbs.), kilograms and metric tons (2,200 lbs.).

Progress reports were made during the course of the study. At the request of the AID Contract Office, a preliminary written report on the proposed form and content of the draft report was submitted by AFSI. This included very preliminary conclusions based on early U.S. field work. Preliminary conclusions from analysis of import/export figures of Hong Kong and Singapore was submitted to the AID Contract Officer in January, 1983. Field work in Asian markets was still in progress at that time.

Due to time delays experienced in the conduct of the field work because of the holiday season -- a possibility recognized in the subcontract -- the date established for the submission of the draft report to PIP was March 15, 1983. PIP asked for and received comments from AID/Washington prior to finalizing the report.

III. MARKETS AND MARKETING

A. Approach Utilized in Study

1. Commodities. A number of commodities were identified in the scope of work as being produced, or producible, in commercial quantities in Thailand for processing and provided the initial list of commodities to be considered in the study. (See Introduction II for listing of study commodities.)

Analysis of prior studies of Thai agricultural production, processing and exports available to AFSI generally confirmed that commodities listed are currently grown on a commercial scale, or could be, in Thailand. (With respect to some commodities such a conclusion may be questionable. An independent investigation was beyond the scope of work of the study.) The market development potential of the commodities was explored in the four markets. In addition the analysis indicated that certain other commodities, not included on the list, might provide market development opportunities in some or all of the markets. These were also investigated in the study.

2. Forms of Processing. The study focused on the export market potential for processed commodities, not on fresh exports. Any apparent substantial potential for exports of fresh commodities identified during the course of the investigation is reported but not analyzed.

The market development potential for a particular commodity in a market cannot just be defined in terms of the name of the commodity. The form of processing is normally a critical aspect, e.g. there may be no development potential for canned mangoes but there may be a substantial potential for mango juice. Forms of processing considered included canned or bottled, frozen, juiced, dried and pickled. Findings of this study are reported not only in terms of commodities but also in terms of processing if sufficient information was available.

3. Marketing Channels. The primary objective of the study was to investigate and assess the relative development potential of the processed commodities. An equally important objective was the identification of the marketing channels which Thai exporters can utilize to capitalize on the potential. The goal was to identify some buyers of the particular processed commodity and what their specific requirements are. Those are the requirements that a Thai exporter will have to satisfy.

In pursuing this aspect of the study, importing brokers and organizations, wholesalers, consumer marketing organizations, manufacturing organizations, and others--whatever type of organization handled the product in the marketing system of the market being investigated - were consulted.

4. Different Markets for a Commodity Within a Country. Market development potential of a commodity processed in a particular form must also be defined in terms of the markets served. Channels serving the different markets are usually different and vary considerably in terms of participants, who they buy from and sell to, and requirements in terms of specifications, packaging, quantities and pricing.

Markets served can be generally categorized as consumer, institutional (meal-serving organizations), and manufacturing. The latter category has a number of sub-categories, dependent on the food product being manufactured.

5. Differences Between Countries. The study was concerned with the development potential for the processed commodities in four countries. The marketing system, market potential, requirements and competitive considerations are different in each. There may be significant development potential for a particular processed commodity in several or all of the markets being investigated, or there may be none. Therefore it was necessary to analyze the market development potential in each of the markets separately and, upon completion, to combine the findings for the four countries into a comprehensive, integrated market development program for Thai exporters.

B. Thailand: Fruit and Vegetable Industry

1. Introduction

An in-depth analysis of the production, processing and marketing of fruits and vegetables in Thailand was beyond the scope of work of the study. However, aspects of particular relevance to the supply of export markets identified subsequently and the recommended market development program were considered.

Conclusions here are based primarily on relevant prior experience and studies by AFSI in Thailand, analysis of recent studies on the Thai fresh and processed fruit and vegetable production, processing and domestic and export marketing, Thai export and other governmental statistics, and interviews with the Department of Agriculture and Department of Commercial Relations of Thailand, the Food Processors Association and a number of companies processing study commodities.

2. Fruit and Vegetable Distribution System in Thailand - An Overview

Thai production areas of fruits and vegetables, are on the whole, small in size, although some fruit growers may have 25-30 rai.* Therefore, marketed amounts of produce by individual farmers are similarly small and transporting vehicles are required to pick up produce from a number of farmers in order to finish out a load. Farmers bring their produce in bamboo baskets from remote farms to drivable roadsides where open-air, non-refrigerated trucks pick it up.

Bamboo baskets are the common packaging method and produce is usually sold by the basketful. In its simplest form, produce is collected by middlemen at assembly points, and the produce is consigned to wholesalers who then sell to retailers, or to exporters, depending upon the crop. Produce grown close to Bangkok where the wholesalers, exporters and the central market are situated, may have short cuts in the marketing system compared to other perishable crops some distance from these key elements of the system.

One important element in the marketing system is that most perishable crops are grown for domestic consumption and the export and processing markets get what is more or less left over from domestic use. For this reason, the

*1 acre = 2.5 rai

amounts available for export/processing will depend upon the domestic demand for a particular crop. This is in marked contrast to Taiwan that produces crops specifically for the export market. A part of the Taiwan production and marketing system is geared for exports. In this way, exporters have a good estimate on the volume of various crops that will be available.

Grading

There is no sorting or grading by producers for most perishables. A basketful of produce is expected to have variations from the highest quality down to the lowest. The practical reasoning behind trading in this manner is that produce from growers is in small amounts and some time has to be used to pick it up and transport it to assembly points. Sorting into grades might slow down transactions at every level of the marketing chain. Since grading takes time - and perishable crops are transported with no refrigeration - delays could spoil or lower the quality of the most highly perishable crops.

Grading on a limited basis is done at the end of the marketing chain, or by the wholesalers (mostly for export markets) and by retailers in the domestic market.

Domestic Consumption of Fresh Fruit and Vegetables

About 90 percent of all fresh tropical fruit produced in Thailand is used for domestic consumption. Some fruit species that are available year-round from various areas are: tangerines, pomelos, bananas, grapes, jujube, papayas, guavas, coconuts and jackfruit.

Seasonal fruit include mangoes, lichees, durians, rambutans, mangosteens, longans and custard apples.

Except for juices, Thais prefer to eat fresh fruit rather than that which is processed.

There are no estimates available on the percent of vegetables that are consumed domestically in comparison to what is exported. Vegetables, however, do not have as high an export value as fruit. All vegetables are consumed in the fresh form in Thailand. Thailand produces a large amount of vegetables in several areas of the country, although the northern provinces are the most prolific producing areas.

Export Market

Large exporters are said to purchase up to 70 percent of their produce from wholesalers, whereas small exporters are said to buy about the same percent directly from farmers. The advantages of buying from middlemen are

volume and quality. However, the lack of exporter control between harvest and packing for export is said to be the principal reason for the high percentage of damage claims by foreign importers of Thai fresh produce.

Quality Production

The present system tends to hamper export trade in fruit and vegetables because it offers farmers no incentives to provide high quality produce. Produce exporters have had difficulties in obtaining sufficient amounts of good quality produce to fill orders. Most of the vegetables as mentioned are grown for the domestic market, where quality demand is not as exact as the export market. This accounts partially for the lack of incentives for higher quality produce.

The system works well in the domestic market but exporters need improvements in the quality of produce for the international market.

Refrigeration

Refrigeration facilities are not used to transport fresh fruit and vegetables to domestic processors or export markets with a couple of exceptions. Longans, which are a highly perishable commodity and a good export earner, are being shipped to Singapore from the north by refrigerated trucks operated by the Government Cold Storage Organization (CSO) in Thailand. This organization has 32 trucks with cold storage units of approximately 25 cubic meters each. The trucks are used mostly to transport fish products from South Thailand to Bangkok.

At least some grapes are transferred to Malaysian refrigerated trucks at the Thai border and then transported to Singapore. The Malaysian government is protective of either Malaysian cold storage transport companies and/or its part of the Singapore market in competitive perishable crops.

Quality of Perishable Products

Maintaining the quality of perishable products is, at best, difficult in hot, humid climatic zones with all the necessary support to the system such as; containers, sorting into grades, and knowledgeable producers and food handlers who know the importance of maintaining high quality produce. There must be adequate incentives and necessary facilities to supply produce of high quality.

It appears that processors and exporters - and wholesalers who supply these markets - realize more the importance of providing high quality produce than domestic handlers.

Reviewed briefly below are some of the more important domestic elements that contribute to poor quality produce which is particularly detrimental to the processing and export markets.

Lack of knowledge or incentives to product quality - Growers and food handlers, by tradition, provide to the market system basketsful of produce which is of average quality throughout the container. There are few, if any, incentives to upgrade the quality of produce that enters or travels through the system until it gets to wholesalers who supply exporters or retailers on the domestic scene.

Transportation of Produce - As produce moves through marketing channels, bad roads, the long collection process, lack of cooling facilities, inadequate packing containers and carelessness by transporters insure the produce will most likely be less than the best quality. The long distances to market may delay produce reaching its destination for up to 50 hours although 12-15 hours is more common. However, the lesser figure under the climatic conditions of Thailand can cause severe loss of quality and actual physical losses.

Production: Mainly for Domestic Consumption. Production in Thailand of fruits and vegetables is mainly for domestic use, what's left over is processed or exported fresh. Importers both for fresh produce and processed foods, because of the domestic priority, cannot be assured of a set volume because processors and exporters do not know how much of a particular crop they can purchase. Without larger producing areas of fruits and vegetables prioritized for the export market (better grading, transportation, refrigeration and more volume), it will be difficult for Thailand to increase its share of the international market in some crops.

Lack of Cold Storage Facilities. Cold storage facilities in the transport of fresh produce to processing plants in Thailand is largely unavailable reportedly causing substantial lowering of quality of perishable crops requiring long hauls. (See Report on Project Identification at the Thailand Institute for Scientific and Technological Research, PIP/AFSI, Harvey C. Neese, 1982. Report No. PIP/Thailand/Apr 82/No. 6.)

Once the quality of perishable foods is lowered, no amount of processing will reverse the loss in quality.

In order to provide a graphic overview of fruit production in Thailand, Table 1 shows estimated production of principal fruit species during the 1978/1979 period. Export performance of some fresh fruit exports is shown in Table 2.

Thailand has an established pineapple processing industry which exports its production to world markets and comprised 97% of all Thai processed fruit and vegetable exports in 1980.

Only relatively small quantities of other commodities are processed. The consensus of all studies reviewed and those interviewed was that the domestic market, present and potential, for processed fruit and vegetable commodities is small. Essentially all are exported.

Processors as well as others surveyed and interviewed identified three principal constraints to export market development of study commodities. The first is the identification and development of export markets which this study is intended to address.

Lack of a reliable and adequate supply of commodities for processing of the consistent quality required is a second major constraint. Establishment of a reliable commodity supply by processors will be necessary for capitalization on the development opportunities identified in this study. Addressing this constraint was beyond the scope of this study but will be included as an important part of the recommended integrated market development program.

Availability of cans, cartons and packaging materials is not a problem, although in some cases quality is inferior. Sizes of cans available and utilized in Thailand are:

Can Size

<u>Oz. (Approx.)</u>	<u>Grams</u>
20	565
6.5	180
16	453.6
15	425
43	1,219
5.5	155
14	400
106	3,000
8	225
55	3,061

Other sizes are also available.

High can cost, a constraint in competitiveness, is usually mentioned as a significant factor affecting competitiveness of Thai processors. In Thailand can costs represent approximately 40% of the total production cost, inclusive of content costs. Can costs in the U.S. are only 20-25% of production costs. Export in bulk, large cans or drums, or packaging in other than cans, alleviates this constraint to export market development and has been considered in this study.

Other ways in which can costs might be reduced should be investigated. Such an investigation was beyond the scope of this study but should be pursued as a part of the integrated market development program.

TABLE 1
Fruit Production in Thailand by Regions, 1978/1979

Production	Central Region		Northern Region		Northeastern Region		Eastern Region		Western Region		Southern Region		WHOLE COUNTRY	
	Total (000 kg) Produc- tion	Planted Area Rai (000)												
1. Tangerine	443	1.5	7,113	22.9	138	.6	102	.5	1,178	1.0	3,511	5.5	12,466	32.0
2. Mango	40,344	950.0	85,729	300.1	249,223	504.0	77,262	225.0	169,793	117.2	17,458	58.8	639,809	1,354.8
3. Rambutan	132	1.6	527	2.0	5	.02	69,109	110.2	381	1.4	1,051,726	1,073.0	1,121,880	1,188.5
4. Longan	129	.6	99,356	177.6	13,995	19.2	169	.9	613	1.6	-	-	114,263	200.0
5. Lichee	184	.6	7,071	25.5	92	.2	336	2.2	719	2.5	-	-	8,403	31.0
6. Pomelo	2,972	4.9	15,443	19.9	4,524	6.0	2,680	5.0	6,574	6.7	14,276	16.3	48,468	60.8
7. Durian	6,580	20.2	4,803	6.4	.1	.001	32,892	126.2	123	.4	221,427	236.0	265,824	389.0
8. Mangosteen	413	1.0	335	.5	6	.006	11,337	17.4	65	.1	20,134	58.3	32,290	77.2
9. Banana (Hom Thong)	6,222	10.5	4,438	7.1	5,095	9.9	9,280	14.7	5,308	7.2	29,199	30.2	59,542	79.6
10. Banana (Nam-Na)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. Lime	2,436	9.3	5,330	16.8	3,441	11.6	4,158	18.4	31,158	28.0	26,698	22.0	75,221	105.8
12. Grape	-	-	6	.003	-	-	.3	.002	40,151	14.0	103	.07	40,261	14.2
13. Sapodilla	12,287	26.0	19,451	66.1	3,932	9.9	4,997	18.8	22,164	35.0	13,364	27.1	76,195	182.8
14. Custard Apple	3,289	5.1	19,934	10.2	63,117	28.4	1,800	2.3	6,981	2.2	2,014	1.4	97,033	49.6
15. Jack Fruit	992	11.6	17,126	99.3	12,962	92.7	20,914	39.5	2,567	28.1	6,153	51.4	66,713	323.0
16. Tamarind	13,603	26.5	76,689	162.7	135,132	337.4	17,052	22.2	19,443	30.5	10,107	28.7	272,027	608.0
17. Guava	21,366	23.5	26,528	27.1	42,645	54.9	7,010	8.1	6,493	7.4	10,189	10.8	114,231	131.7
18. Langsat	-	.00	7,167	14.6	-	-	2,625	6.3	15	.02	43,436	38.7	53,244	59.8
19. Sweet Orange	151,318	97.8	40,286	39.1	1,566	1.2	41,626	115.7	11,009	10.0	85,703	55.7	331,508	319.3
20. Coconut	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21. Watermelon	17,296	8.6	60,089	53.4	192,518	104.0	12,805	7.0	53,007	17.5	141,049	61.4	476,764	251.0
22. Pineapple	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* 1 acre equals 2.5 rai Source: Technical Working Group on Food Products - Thailand; ASEAN Working Group, Report II, 1981

TABLE 2

Export Performance of Some Fresh Fruits, 1978-1980

Product	1978		1979		1980	
	Q	V	Q	V	Q	V
Banana	19,170,433	30,084,530	19,143,660	31,706,331	12,679,746	28,920,563
Mangoes	3,171,123	13,306,795	3,266,159	19,386,512	3,086,609	18,736,176
Pineapple	93,525	427,356	6,314	58,719	36,121	193,416
Mangosteen	292,839	1,851,962	130,282	1,381,042	149,561	1,452,115
Oranges	4,495,299	16,345,238	1,431,570	8,363,409	1,506,502	11,962,814
Lemons/Limes	49,236	668,635	173,425	1,558,276	2,228,698	483,919
Pomelos	2,130,295	12,783,902	1,995,962	13,673,562	2,228,698	18,440,165
Grapes	1,910,985	20,122,503	2,088,229	23,885,704	1,560,983	18,073,004
Longans	1,971,447	34,891,028	3,286,123	55,772,917	5,000,000	92,800,000
Watermelon	538,888	1,031,412	567,830	1,060,616	343,059	1,076,169
Rambutan	304,291	1,760,667	234,083	1,784,943	105,124	1,093,301
Durian	2,478,038	23,371,335	3,096,142	31,172,275	3,513,821	37,584,719
Sugar Apple	1,119,860	6,023,384	735,409	4,545,909	726,433	5,515,000
Papaya	4,510,876	10,668,946	6,033,198	15,356,208	4,735,000	14,344,939

Source: Technical Marketing Group on Food Products-Thailand;
ASEAN Working Group, Report II, 1981

Export performance of some selected processed study commodities in 1981/1982 from Thailand is given in Table 3.

TABLE 3

Exports of Selected Processed Study Commodities

Product	1981		1982*	
	Quantity**	Value	Quantity	Value
Rambutan	507,189	16,338,976	396,966	11,283,406
Rambutan with Pineapple	1,307,089	33,857,627	905,511	22,181,561
Longan	352,432	14,323,087	367,758	12,488,528
Lichee	15,267	567,113	11,784	425,384
Mango	104,748	3,007,520	80,517	4,003,276
Papaya	4,886	105,636	-	-
Banana	32,028	736,751	12,645	223,238
Young Corn	1,228,594	28,897,618	867,259	21,462,033
Mushroom	7,374	286,837	1,602	83,858
Bamboo Shoot (Canned)	1,734,392	22,673,436	1,502,643	22,057,259
Peas	9,040	125,304	102	1,838
Asparagus	1,358	41,218	70	3,216

* January - August 1982 figures only.

**Quantity is in kilograms.

Source: Customs Department, Ministry of Finance, 1978 - 1980.

Tables 4 and 5 give the processing capacities of selected fruits and vegetable commodities in Thailand in 1979/1980.

TABLE 4
Processing Capacity For Selected Canned Fruits in Thailand
1979/1980

Product	Estimated Processing Capacity/Carton Per Year	Seasonality	Number of Manufacturers and Exporters
Rambutan	500,000	April-May Aug-Sept	20
Rambutan with inserted pineapple	250,000	April-Sept	22
Lichees	500,000	May-June	2
Mangoes	350	April-May	2
Baby Bananas	12,000	Oct-Nov	2
Papayas	NA*	Aug-Oct	2
Tropical Fruit Cocktail	600,000	Sept-Dec	2
Longans	600,000	July-Aug	13

*NA = Not Available.

Source: Technical Working Group on Food Products-Thailand ASEAN Working Group, Report II, 1981.

TABLE 5
Processing Capacity For Selected Canned Vegetables in Thailand
1979/1980

Product	Estimated Processing Capacity per Year	Seasonality	Number of Cannerys
Young Corn	400,000 Cartons	June-Dec	13
Bamboo Shoots	200 MT	June-Nov	6
Mushroom	100,000 Cartons	Jan-March	7
Asparagus	5,000 Cartons	June-Oct	1
Cow Peas	*NA	Oct-Dec	2
Sugar Peas	20,000 Cartons	Feb-May	4

*NA = Not Available

Source: Technical Working Group on Food Products-Thailand ASEAN Working Group, Report II, 1981.

C. U.S. Market Development Potential

1. Introduction

The general framework of the U.S. marketing system for the study commodities is outlined in this section.

a. Sources of processed commodities. Of the study commodities, only mushrooms and green asparagus are produced in any significant quantities in the mainland U.S.; guavas (not a study commodity but considered as a possibility) and papayas are grown in Hawaii and, to a limited degree, in Florida. With the exception of green asparagus, the above mentioned commodities are also imported in substantial quantities from other countries. All of the other study commodities are imported.

b. Marketing channels. The U.S. marketing and distribution system for processed fruits and vegetables is complex, with numerous specialized avenues dependent on the commodity, form of processing, relative importance of the commodity, sources of supply and the nature and location of the markets served. Numerous commercial organizations are involved in the marketing and distribution of even the limited number of commodities considered in this study.

Specific channels for the study commodities will subsequently be considered but a description of the principal marketing channels here will provide the necessary background for an understanding of discussions which follow. Marketing and distribution channels for domestic products may be different than those for imported products. The focus of this study is on the handling of imported items.

Imported consumer-packed items are generally handled in the following ways:
Canned or bottled fruits or vegetables

Chain supermarkets. Most consumer food sales in the U.S., estimated to be in excess of 90% of all food dollars spent, are made by national regional or local supermarket chains. Most do not import directly, buying imported commodities from importing wholesalers or U.S. manufacturers. Some large, national chains do import some high-volume items directly, often private-labeled by the overseas suppliers. The study commodities are not

high-volume items for supermarkets. Ethnic markets and natural foods are being emphasized currently in chain marketing programs. Some of the larger chains also operate processing (manufacturing) plants for particular products.

Importers/wholesalers. There are numerous wholesaling organizations with a wide variety of interests. Some are national in scope; others are only regional. Most specialize in the types of commodities they handle and markets they serve. The larger ones sell to chains, others wholesale to smaller distributors; some serve just institutional markets, while others serve independent stores. Some have a relatively wide range of products, others only a few produce. Some of the larger importers/wholesalers have processed commodities that they handle private-labeled by overseas suppliers. None of the importers/wholesalers interviewed in the study import in bulk and can or bottle into a consumer-pack in the U.S.

Frozen Items

Chain supermarkets. The study commodities are normally not high-volume items and chains normally will not import directly. Requirements are purchased from importers.

Importers/wholesalers. Usually frozen products will be imported by wholesalers with adequate facilities specializing in the handling of these items. Some of the larger organizations will handle non-frozen items as well.

Dried/Dehydrated Tropical Fruits

Chain supermarkets. No chain interviewed imports this category of processed commodity directly. Dried fruits are categorized as a "natural food", an active growing segment of the market. Natural foods are usually sold unpackaged to consumers in natural food sections of retail stores which are normally supplied and serviced by an independent, specialized distributor called a jobber. One large national chain is considering direct import and operation of natural food sections in its stores with its own personnel.

Importers/wholesalers. The usual method of handling dried tropical fruits is as follows: A few major importers specialize in handling this type of

commodity supplying regional and local wholesalers/jobbers, who in turn supply and service chains and independent stores. Some smaller importers/wholesalers serving limited markets or areas also import direct.

Tropical Fruit Juices

There appears to be no significant import of consumer-packed tropical fruit juices. Most raw materials for manufacture of these juice products are imported.

Imported items for the institutional trade are for the most part handled in the following manner:

Importers/Wholesalers. National and regional importers, often specializing in serving the institutional trade, handle commodities destined for institutions, marketing directly to institutions and to smaller wholesalers who do not import direct. Some large importers have products private-labeled by suppliers.

Marketing channels for commodities imported for manufacturing are given below. If the volume of the commodity used is substantial, large manufacturers will usually import direct. If volume required is small, manufacturers buy from importers who specialize in the commodity. Form of processing, specifications and packaging are determined by the requirements of the manufacturer.

c. Principal sources of data and opinions utilized. Important published, sources of data utilized in this aspect of the study include:

- . U.S. import statistics (1980-81)

- . U.S. Department of Agriculture publications with respect to production, marketing, and product specifications.

- . Almanac of the Canning, Freezing and Preserving Industries (1982).

- . Confidential detailed reports of product case deliveries to retail stores in California, and national summaries, by retail food organizations representing over 80% of all food dollars spent in the U.S., for the 52 weeks ending December 10, 1982. (SAMI reports)

The main thrust of the investigation was to secure the advice, opinions and comments of those actually buying and marketing the commodities in order to provide realistic assessments upon which Thai processors and exporters can base subsequent market development efforts. Numerous organizations were consulted and interviewed. The organizations consulted in broad categories are given below. (In some cases several people from a particular organization were consulted.)

- . Chain supermarket organizations with nearly 6,000 stores throughout the United States.
- . Twelve national or regional importers/wholesalers of consumer-pack food products from Asia, including reportedly the largest in the U.S.
- . Three dried tropical fruit importers.
- . The two reportedly largest consumer-packed gourmet food importers in the country.
- . Six importers/wholesalers serving the institutional trade.
- . Nine (processors) manufacturers.

2. Study Commodities with Little Development Potential. Initial emphasis of the investigation was on the conduct of a general comparative assessment of the development potential of all the study commodities. The objective of this initial assessment was to identify those offering substantial development opportunities - justifying in-depth investigation - and to eliminate those with little development potential. Commodities found not to have significant market demand were eliminated; some commodities with substantial demand were eliminated because of competitive considerations.

It should be emphasized that just because particular commodities were eliminated from further consideration in this study does not mean that the commodities are not imported at all nor should it be interpreted as expressing any opinion as to whether a market might develop for the commodity in the future.

Commodities found to have little market development potential for Thai exporters, along with the principal reasons for the conclusions, were:

Longans, rambutans and cowpeas. There is no significant market demand for these commodities in any form.

Bananas. No market demand for canned or dried bananas was found. There is a small demand for banana purees and a significant, but not large, demand for banana chips, prepared by a cooking process for the natural foods market. The banana market is highly competitive; the Philippines has substantially the whole market in banana chips.

Canned or frozen tropical fruit. There is no significant demand for canned guavas, mangoes, or papayas. While there is a substantial demand for imported fresh papayas and mangoes, particularly for the Latin ethnic market, the canned or frozen product has not been accepted in the marketplace as yet. Canned lichees do have a demand in the oriental ethnic market, but the consensus of those consulted was that it is small and is not a growing market. The principal source of canned lichees is Taiwan.

Canned tropical fruit cocktail. This product is called "tropical fruit salad" in the U.S. Del Monte, the only organization found to handle the product, imports it from the Philippines, private-labeled. Demand is limited and is not growing. While some of those interviewed were of the opinion that a market could be developed - if the product could be supplied at a price competitive with the Western fruit cocktail - the consensus was that no significant market currently exists.

Sugar peas. There is substantial demand for many varieties of peas and lentils in the United States. There is considerable domestic production of these commodities with few imports. With the emergence of Turkey as a major supplier of lentils in world trade, and the economic effect on U.S. producers, it is possible that substantial imports of processed peas from Thailand could generate political as well as major economic repercussions.

Frozen pea pods, with or without water chestnuts, are imported from Taiwan. This market may have limited development potential for Thai exporters. (See comments in the subsequent section referring to water chestnuts).

Mushrooms. There is a large demand for fresh canned and dried mushrooms, over 150,000,000 pounds annually. Canned mushroom imports in 1981 were 90,000,000 lbs.; China provided 32%, Taiwan 27%, Hong Kong 26% and Korea 11% of the market. Dried mushroom imports were 1,526,071 lbs; Japan 57% (primarily a special variety, Shitaki), Taiwan 15%, and China 1%.

There appears to be little opportunity for Thai processors to break into the market. Thailand produces straw mushrooms, a variety with no significant demand in the U.S. and some Champignon (button) and Abalone (oyster) mushrooms. Competition, both from domestic producers and imports, is intense. U.S. producers have been seriously affected by imports - with the recent emergence of China as a major supplier - and have recently petitioned the U.S. government for import restrictions.

Cashews. There is a strong demand for cashews in the U.S. market. All are imported. In 1981, 60,933,526 lbs. were imported; Brazil provided 40%, Mozambique 34%, India 15%, and Tanzania 8%. Current suppliers are well-established and competition is intense. It would be difficult for Thai exporters to profitably enter into the market in any substantial way.

3. Study commodities with substantial development potential. The following study commodities were found to have a substantial market development potential in the U.S. for Thai exporters:

(a) Tropical Fruit Purees: Guava, Mango, Papaya.

Guava, mango and papaya purees are used in the manufacture of tropical fruit nectars, a type of pure fruit drink having a higher pulp content than other fruit juices. Tropical fruit drinks are marketed only as nectars, not as juices.

Structure of the market. Fruit nectars are well-established in the U.S. market; tropical fruit nectars were only introduced three or four years ago and are a rapidly growing segment of the nectar market. A variety of fruits are utilized for nectars, both temperate zone and tropical, either singly or in combination with other fruits. Pineapple concentrate is used in substantial quantities for blending purposes.

Consumer-pack, ready-to-use tropical fruit nectars are not imported. High import costs make them non-competitive with other nectars and juices.

Nectars are manufactured by U.S. companies from puree supplied by Hawaii and other countries. Tropical fruit juices, in addition to nectars, may be introduced to the market in 1983. Purees will also be used for the production of these juices. The supply of purees for nectar and juice production offer an excellent market development opportunity for Thai exporters.

Numerous manufacturers supply the large U.S. citrus and non-citrus juice market. Only a limited number produce tropical fruit nectars. Kern Foods Inc., headquartered in California with nationwide distribution, is reportedly the largest manufacturer. Libby, McNeil and Libby, Del Monte, and smaller

producers serving limited regional markets also produce tropical fruit nectars. Manufacturers distribute nectars to supermarket chains, institutions and wholesalers who, in turn, supply smaller retail outlets and institutions.

Kern imports purees directly from overseas suppliers. Del Monte secures guava and papaya purees from its own agricultural processing operations in Hawaii. Libby, McNeil and Libby, and smaller manufacturers normally purchase puree requirements from importers.

Market Demand. Imports of tropical fruit purees from other countries are not reported separately in U.S. import statistics. Hawaii supplies substantial volumes of guava and papaya purees, but not mango purees. Purees are also used in the production of food products other than nectars.

No estimate of the total demand for tropical fruit purees for manufacture of nectars is available. However, specific requirements identified in this study and the size of the demand for nectars produced from the purees indicate a substantial demand.

To illustrate the size of the market for nectars, in the 52-week period ending December 10, 1982, 1,179,607 cases of nectars were delivered to supermarkets in California, 42% of which were tropical fruit. Most popular of the tropical nectars was guava (23%), followed by papaya (17%) and mango (15%). Kern supplied 97% of the tropical fruit nectars, and 86% of all nectars delivered in California and is the major supplier of such products elsewhere in the U.S. (Derived from SAMI reports).

The major demand for tropical fruit nectars is in the Latin ethnic market. According to 1980 U.S. census figures, the Spanish origin population in the United States was 16.5 million and is the most rapidly growing segment of the U.S. population. This indicates that the tropical fruit nectar market is likely to continue its rapid growth. The Latin population is concentrated in California (31%), Texas (20%), New York/New Jersey (15%), and Florida (6%).

Sources of supply. The initial, and still a major, source of guava and papaya purees for nectars is Hawaii. Significant quantities of these and mango purees are supplied by Brazil, Mexico, the Philippines, and other countries. Principal sources of pineapple concentrate are Hawaii, the Philippines and Thailand.

Manufacturers, with the exception of Del Monte, and importers purchase their puree requirements on a competitive basis from any reliable source.

Prices. Prices fluctuate in response to supply and demand. Current price ranges (January, 1983) quoted are:

	Price Range CIF West Coast <u>US cents/lb.</u>
Guava (frozen)	32-36 cents
Papaya (aseptic/frozen)	20-25 cents
Mango (frozen)	54-64 cents

Tariff and Import Considerations.

Current rates of duty on mango, guava and papaya purees from Thailand are set for in Table 6.

TABLE 6

U.S. Tariffs on Tropical Fruit Purees
Imported From Thailand

Schedule Number	Commodity	Rate of Duty
152.58	Mango Puree	Free
152.54	Guava Puree	Free
152.65	Papaya Puree	17.5% AD VALOREM

Source: Tariff Schedule of the U.S. (annotated) 1982.

The Food and Drug Administration (FDA), and more specifically its Compliance Section, is the government agency responsible for application of regulations pertaining to imported processed foods. All labels must comply with the food labeling regulations. (See 21 Code of Federal Regulations Part 101.)

No pre-clearance (sample testing and approval prior to import) of any imported processed foods is necessary, although the agency may test samples after importation. However, manufacturers of "thermatically processed low-acid foods packaged in hermetically sealed containers" must be registered before imports of such foods will be permitted. Approval of manufacturing facilities and operations is required for registration. (See 21 Code of Federal Regulations Part 113 and sample form in Appendix A for still retort processes.)

Product specifications and packaging. There are no established specifications for tropical fruit purees for nectars or other products. Typical specifications are set forth in Appendix B.

The form of preservation of purees is an important consideration for manufacturers. The alternatives are a) canned in Number 10 or 5 gallon cans, b) frozen in drums or in cardboard cartons, minimum weight 25 kg. or c) aseptic pack in a poly bag placed in a cardboard carton or wooden crate, minimum weight 25 kg.

The preferable form is aseptic packaging with the frozen product currently being acceptable; canned is the least desirable. The canned product is difficult and costly to handle in the manufacturing process. The frozen product requires refrigeration during transport and storage, thus increasing costs. Aseptic packaging is a form of processing and packaging which preserves the product during distribution and storage without refrigeration; utilization of this form minimizes the problems that manufacturers encounter with canned or frozen products.

Kern, for example, will not buy purees canned or frozen in metal drums. This firm buys frozen mango purees from Mexico and the Philippines; it would prefer aseptic packaging but it is not currently available. Philippine producers are considering installing an aseptic packaging line. Papaya purees are purchased aseptically packaged from Hawaii. Guava purees are frozen;

there is a technical problem, a change of color, which occurs with aseptic processing of guava which has not been solved as yet.

In development of the market opportunity identified here, Thai processors should not consider canning or freezing purees in metal drums. In order to achieve maximum market development, aseptic packaging should be utilized for mango and papaya purees, and for guava purees if the technical problem can be solved. A frozen product can also be utilized but the degree of market development is likely to be significantly less, and will always be subject to increasing competition from producers elsewhere who do provide the preferred form -- aseptic packaging.

Some additional comments with respect to aseptic packaging are warranted. This process can be used for the preservation of a wide variety of fruits, vegetables and other food products, not just purees. Not requiring refrigeration, it is a preferred form of packaging of products for manufacturing or repackaging. To illustrate, Del Monte is using aseptic packaging for pineapple concentrate in Hawaii, 300-gallon poly bags placed in wooden crates. One report stated that the Thai pineapple industry packs pineapples in 350 pound bags which are shipped in wooden crates. This is assumed to be aseptic packaging.

It is recommended that an in-depth investigation of the technology and economics of aseptic processing and packaging of food products generally be incorporated in the overall Thai export market development program for other processed foods as well as pineapples.

Specific Importers Identified. During the course of the study the following prospective purchasers, all indicating an interest in considering Thai suppliers of guava, mango and papaya purees for nectars, were identified and interviewed. All buy only in container loads on L/C terms.

Kern Foods, Inc., California. As mentioned previously this is reportedly the largest manufacturer of tropical fruit nectars. It directly imports guava, mango and papaya purees and pineapple concentrate. Its annual requirements, and the form of processing of its current supply are:

Guava puree (frozen)	1,000,000 lbs.
Mango puree (frozen)	500,000 lbs.
Papaya puree (aseptic)	700,000 lbs.
Pineapple concentrate	30,000 gallons

Libby, McNeil & Libby, Illinois. The company does not import directly. It purchases from certain importers with whom it has a continuing relationship. In some cases the importers purchase from suppliers nominated by Libby. It does not purchase papaya purees. Its annual requirements are:

Guava puree (frozen, Number 63 cylinders)	50,000 lbs. plus
Mango puree (frozen, Number 64 cylinders)	128,000 lbs.

Daisy Fresh Division, Real Fresh, Inc., California. This company is a smaller, regional manufacturer of nectars. It directly imports pineapple concentrate, guava and papaya purees from Hawaii and other countries. It does not import mango purees. While the company was unwilling to separately estimate annual requirements of each, it did estimate that total annual requirements for the three products were approximately 1,000,000 lbs. a year.

(b) Dried Tropical Fruits: Papayas, Pineapples

Structure of Market. Dried fruits having substantial development potential for Thai exporters are papayas and pineapples. Demand for dried mangoes is small. All such dried fruits are imported.

The commodities are marketed through the natural foods distribution system. This is a specialized market system which supplies the U.S. demand for dried temperate zone and tropical fruits, seeds, grains and nuts, with little or no processing and without additives. Cashews are sold raw as a natural food, as well as being marketed like other food products in the canned, bottled or packaged, raw or roasted and salted form.

Most dried tropical fruits are imported by a limited number of importers who specialize in this trade; these importers will be the principal purchasers from Thai exporters. These importers import large quantities of fruit and supply smaller, usually regional, natural food jobbers. Due to the diversity of natural foods, few retail stores maintain the stock of that section of their operations as they do with most products they sell. Jobbers perform that function, sometimes with repackaging into consumer-sized poly bags but more often utilizing a series of consumer, self-service, bulk bins. This is the current manner of operation of even the largest supermarket chains.

Market demand. No estimate of the total U.S. demand for these commodities is available. All are imported but quantities are of little significance in relation to overall food imports into the U.S. and are only reported in "catchall" sections of U.S. import statistics and not separately.

From interviews and store surveys during the course of the study, it is evident that there is a significant market demand, in excess of 12,000,000 lbs. a year. The market has grown rapidly during the past four or five years, and it is expected to continue growing. Dried pineapple rings have the largest volume; dried papayas have a substantial volume and are rising in relation to pineapple. The volume of dried mangoes sold is relatively small, probably due to its high price relative to other dried fruits.

Sources of supply. The major supplying country is Taiwan; the Philippines also supplies substantial quantities. Recently Thailand has started supplying U.S. importers. One Thai company is shipping two to three containers (80-120,000 lbs.) a month to the U.S. market.

Importers indicated that dried fruits are in short supply at the present time and they are seeking new, competitive suppliers. Although Taiwan product quality is higher than that of the Philippines, the cost of the Taiwan commodities is higher and continues to rise. Initially 24 companies in Taiwan produced the products, now there are six much larger companies. As is the case with most agricultural products in Taiwan, a set price is established for all dried fruit exports and buyers have little opportunity to negotiate lower prices. Taiwan as principal supplier to the U.S. market is vulnerable to Thailand's entry into the market, providing that Thai companies can provide quality products at competitive prices.

Prices. Import prices for dried tropical fruits have not fluctuated because of supply and demand during the past three years as has been the case with most agricultural commodities. In the past, prices have generally risen in line with the rate of inflation. However, there has been a 10% rise in prices during the past three months, tending to confirm the existence of a current supply shortage.

While importers interviewed declined to provide specific prices which they are paying, they did give the following current competitive price ranges:

	FOB Taiwan/Phil <u>US\$/Kg</u>	CIF US West Coas <u>US\$/Kg</u>
	<u>Range</u>	<u>Range</u>
Dried Pineapple Rings	1.75-2.50	1.94-2.78
Dried Papayas	1.50-2.25	1.67-2.50

Tariff and Import Considerations. Current rates of duty on dried papayas, pineapples and mangoes from Thailand are set forth in Table 7.

TABLE 7.
U.S. Tariffs on Dried Papayas, Pineapples and Mangoes from Thailand.

Schedule Number	Commodity	Rate of Duty
148.65	Dried papayas	4% ad valorem
148.98	Dried pineapples	\$0.56/lb.
148.02	Dried Mangoes	\$.015/lb.

Source: Tariff Schedule of the U.S. (Annotated) 1982.

Product specifications and packaging. There are no standard specifications established for dried tropical fruits. Only sugar-sweetened spears of papaya and pineapple rings are purchased. Specific quality requirements are worked out between the purchaser and supplier, with size of spears or rings being an important factor.

The imported product is bulk packed in poly bags and then into cardboard cartons containing 20 kgs. Dependent on the importer there may be four bags of 5 kgs. or 2 bags of 10 kgs. No labeling of poly bags is required.

The market development potential of dried tropical fruits for Thai exporters is enhanced - relative to canned, bottled or frozen products - by the packaging requirements outlined above. Can and bottle costs are high in

Thailand; the cost of refrigerated transport to the U.S. is also high. The production of quality can labels required for U.S. consumer markets does not appear to be available in Thailand other than canned pineapples. With acceptable quality and competitive cost factors, the Thai exporter is in a position to be a competitive supplier of dried fruits to the U.S. market.

Specific Importers Identified. During the course of the study, prospective purchasers from Thai exporters were identified and interviewed. All buy only in container loads with L/C terms. They are listed below:

Dae-Julie, Inc., Illinois. A large importer of a wide range of products from Asian and other countries; reportedly one of the two largest importers of dried tropical fruit in the U.S. It wholesales the fruit to regional, natural food brokers and jobbers throughout the U.S. At the present time the company is actively seeking new suppliers. As a matter of policy, new supplier relationships will not be established without a visit by company executives to the production plant.

For competitive reasons, the company declined to provide its annual requirements for dried fruits, either total or by commodity. However, it was indicated that total requirements do exceed 2,000,000 lbs. a year.

Mandalay Food Products Corp., California. This is a smaller importer supplying jobbers on a national basis. The company has only commenced importing dried tropical fruits during the past year. While the company is unable to make any long-term estimate of its annual requirements, its current requirements are approximately 500,000 lbs. a year.

Safeway Stores, Inc., California. Safeway has natural food sections in most of its U.S. stores, and they are experiencing rapid growth. Currently these sections are serviced by jobbers, but it is anticipated that the company will take over the servicing of these sections in the near future, directly importing dried tropical fruits.

Estimated annual requirements of dried pineapple and papaya rings are 4,500,000 lbs. Dried mangoes are not marketed.

(c) Canned Asparagus: White and All-Green

Three types of asparagus are marketed in the U.S. -- white, green-tipped white and all-green. They are sold fresh, canned or frozen. Market considerations for the white and green-tipped white, and all-green are significantly different and are analyzed separately. Since a number of the specific importers identified are interested in both white and all-green, they will be considered at the conclusion of the separate analyses.

White and green-tipped white.

Structure of the Market. All white and green-tipped white asparagus, fresh and processed, is imported. White is considered to be more desirable and only relatively minor quantities of green-tipped is marketed. In subsequent comments "white" will be used to refer to both types. White asparagus is regarded in the market as a specialty commodity with low volumes and high prices relative to all-green asparagus.

There is a substantial market for consumer and institutional pack white asparagus. There is no significant market for manufacture or repackaging.

Most white asparagus is imported by a limited number of importers handling a wide range of imported specialty/gourmet products. They in turn supply supermarket chains and smaller, regional distributors. Some importers distribute to both the consumer and institutional trade while others will specialize in only one of the trades.

Market demand. White asparagus is generally marketed canned in the U.S.; some is bottled but none is frozen. The commodity is only marketed as spears, not as tips or cut as is the case with all-green asparagus.

U.S. imports of canned and frozen asparagus from all countries in 1981 was over 4,000,000 lbs. The statistics do not segregate canned from frozen, white from all-green or consumer from the institutional pack. It is probable, however, that a substantial percentage of imports was white asparagus.

Analysis of retail store case deliveries of canned white asparagus in California provides an indication of consumer-pack demand. Of the 214,379 cases of canned asparagus delivered in the 52 weeks ending December 10, 1982, 12,000 cases, 5.5% were white or green-tipped white. Extrapolation indicates a national demand of over 2,000,000 lbs. per year.

No estimate of the size of the institutional market is available but a comparison of the asparagus imports and consumer-pack demand tends to indicate a significant demand.

Sources of supply. Production of white asparagus is more labor-intensive than the production of all-green asparagus and hence more costly. For this reason, U.S. white asparagus production has been phased out and the U.S. consumer was converted to acceptance of all-green asparagus as the common form of the commodity, processed and fresh. The same consumer conversion has not occurred to the same degree in Europe.

Taiwan, with better production economics, became the principal supplier of white asparagus to the U.S. and Europe. Canned asparagus (all types) production in 1981 in the principal producing countries was:

TABLE 8
Canned Asparagus Production in Principal Producing Countries
(1981)

Country	Cases	Pounds
Taiwan	5,912,000	141,888,000
U.S.	2,844,000	68,256,000
Spain	2,067,000	49,608,000
Japan	965,000	23,608,000

Source: Almanac of the Canning, Freezing and Processing Industries (1982)

Taiwan supplied 4,773,000 cases or 114,500,000 lbs., (81% of its total production) to European countries in 1981. There may be a market development opportunity for Thai canned white asparagus of even greater potential in Europe than in the U.S. market which should be investigated.

From those interviewed and other sources, it appears that there is a market development opportunity for Thai exporters in supplying white asparagus to the U.S. market, despite the current position of Taiwan as principal

supplier. Spain, Peru, South Africa, and other countries are pursuing this opportunity. There is currently a supply shortage of institutional-pack white asparagus for the U.S. market. Both agricultural and industrial labor costs in Taiwan have been increasing rapidly and white asparagus production is labor-intensive. Taiwan is becoming increasingly vulnerable to being supplanted by lower, labor cost countries in earlier stages of economic development than Taiwan is today. White asparagus production shifted from the U.S. to Taiwan in earlier times for the same reason.

Prices. Current prices for Taiwan white and green-tipped asparagus are:

	FOB Taiwan <u>US\$/CS</u>
Consumer-pack: 15 oz. can/24 to case	\$18.00
Institutional-pack: No. 5 squat can (66 oz.)/ 6 to case	\$19.50-19.90

Tariff and import considerations. Tariff and import considerations are the same for white and all-green asparagus. Current rates of duty are:

TABLE 9
U.S. Tariffs on Processed Asparagus from Thailand

Schedule Number	Commodity	Rate of Duty
141.93	White and Green asparagus in air tight containers	17.5% ad valorem
137.95	Fresh, chilled, frozen white and green asparagus	Free

Source: Tariff Schedule of the U.S. (Annotated) 1982

For other import considerations refer to prior comments in the tropical fruit puree section.

Product specifications and packaging. Standard specifications and grades for both canned white and green asparagus have been established in the U.S. They are set forth in Appendix C.

Normal consumer-packs for white asparagus are:

- a) 8 1/4 or 8 3/4 oz. cans/ 24 to case
- b) 15 oz. / 24 to the case

Institutional pack is No. 5 squat cans/6 to the case. The U.S. market is the only one known to use this size can for asparagus; Europe does not. The current supply shortage being experienced by U.S. importers may be due in part to Taiwan packing in institutional can sizes used in Europe and other countries rather than a commodity production shortage. Whatever the reason for the inability of U.S. importers to get adequate supplies from Taiwan, it has stimulated them to search for new suppliers.

All - Green Asparagus

Structure of the market. Essentially all-green fresh, frozen and canned asparagus marketed in the U.S. is grown in the U.S. at the present time. There are substantial markets for both consumer and institutional-pack products but no significant market for manufacturing.

The all-green market is served by the same system utilized for all of the domestically produced vegetables. Cannery process the commodity, supplying supermarket chains, institutions and wholesalers. Private-labeling by canners is relatively common.

Del Monte and Green Giant are major canners/wholesalers of green asparagus. For example, these firms supplied over 60% of the branded, canned asparagus to retail stores in California during the past year. Approximately one-third of canned asparagus sold is private-labeled by canners for supermarket chains such as Safeway which also carry branded products.

Market Demand. The demand for canned, frozen, and fresh all-green asparagus is large. Crop production figures for the past six years illustrate the size of that demand as well as demand trends.

TABLE 10
U.S. Asparagus Production
1,000 T (Rounded)

	<u>76</u>	<u>77</u>	<u>78</u>	<u>79</u>	<u>80</u>	<u>81</u>
<u>For Processing:</u>						
· Canning	41.3	48.5	43.2	39.4	34.5	35.0
· Freezing	27.9	24.9	14.8	24.1	9.9	9.7
Total Processed	<u>69.2</u>	<u>73.4</u>	<u>58.0</u>	<u>63.5</u>	<u>44.4</u>	<u>44.6</u>
<u>For Fresh Market:</u>	46.0	36.7	35.4	32.0	39.2	40.5
<u>Total Production</u>	<u>115.2</u>	<u>110.0</u>	<u>93.4</u>	<u>95.5</u>	<u>83.6</u>	<u>85.1</u>

Sources: Almanac of Freezing, Canning and Preserving Industries (1982);
U.S.D.A.

In 1981, over 11,000,000 lbs. of frozen product and some 68,000,000 lbs. of canned, (79,000,000), were produced. About 6% is exported, 5% is for the institutional trade and the balance for the consumer market. Processed asparagus production declined 28% between 1976 and 1981 while the fresh market fell 13%.

The principal reason for the decline, according to those interviewed was the substantial and increasing price differential between asparagus and other common vegetables. None interviewed felt that it was the result of any softening of demand for the commodity itself; it is still considered a highly desirable vegetable by consumers. The farm price of asparagus for canning has increased 68%, and the FOB plant spot sales price for large spears by 49%. Current retail prices of 15 oz. cans of asparagus, large size spears, are \$1.75 - 2.20; the price of cut asparagus is in the \$1.12 - 1.60 range. Alternative canned vegetables such as green beans and corn retail for \$0.35. - 0.70.

Sources of supply. In 1981, California produced 80% of all fresh asparagus sold, and 20% of all canned or frozen asparagus. Significant quantities are also produced in Washington and Michigan. The number of U.S. canners and freezers processing asparagus has declined significantly since 1978. Increasing costs and unprofitability are given as reasons for the drop.

While production of all-green asparagus is not as labor-intensive and costly as that of white asparagus, it is more than that of other common vegetables. Although it has not occurred as yet, Safeway, Del Monte and

others familiar with the canned/frozen asparagus trade are of the opinion that production and processing of all green for the U.S. market is likely to migrate to relatively low-cost labor countries. Taiwan would appear to be the logical country for development of the supply of processed all-green for the U.S. market, but it no longer can be considered a relatively low-labor cost country. It is unlikely that establishment of the production of all-green for the U.S. market will occur in Taiwan. The consensus of those interviewed was that the supply of all-green market in the U.S. presents a substantial longer term market development opportunity for foreign exporters. In order to capitalize on it, a country like Thailand will have to be competitive with current U.S. suppliers in terms of price, quality and reliability.

Prices. Prices fluctuate in response to supply and demand, and vary dependent on whether spears or cut asparagus are being purchased. Current consumer pack prices quoted are:

	<u>U.S. Prices</u>
	F.O.B. canner plant
	US\$/Case
. Fancy, Spears, Mammoth/Large No. 300 can (15 oz.)/ 24 to the case	\$30-35
. Cut No. 300 can/ 24 to case	\$19-25

Tariff and import considerations. These are the same for both white and all-green. Refer to prior comments with regard to white asparagus.

Product specifications and packaging. Standard specifications are set forth in Appendix C.

All-green asparagus is canned in various styles, and the percentages of each style marketed varies: spears or tips, 37%; cut with tips included 61%; cuts with tips removed, 2%; (percent of cases produced in 1979, latest statistics available).

Different container sizes are marketed as well: consumer pack - No. 300 or 300 cylinder can/24 to case, 77%; 8 oz. can/24, 7.5%; frozen 1 lb./48, 10.5%; institutional pack - No. 10 cans/6 (most) and No. 5 squat/6, 5%. Information is derived from the Almanac of the Canning, Freezing and Preserving Industries. (1982)

Specific importers identified. The following prospective purchasers of white and all-green canned or frozen asparagus for Thai exporters were identified and interviewed. All indicated an interest in considering imports from Thai suppliers, providing quality and price are competitive and suppliers reliable. All buy only in container loads with L/C terms.

Safeway Stores, Inc., California. The volume of white asparagus marketed is too small for direct import to be warranted. It would be interested in importing canned all-green if prices were competitive, possibly on a private label basis. No estimate of requirements was provided but they are substantial.

Del Monte Corporation, California. The company is a major factor in the supply of both canned white asparagus, imported from Taiwan, and all-green asparagus, supplied by U.S. canners. All are private-labeled. The company declined to give its requirements for either type of asparagus but would consider Thai supplies. Del Monte provides crop production and processing technical assistance to its suppliers.

Mandalay Food Products Corp., California. This is a smaller importer of canned vegetables primarily for the institutional market with national distribution. It now imports canned, private-labeled white asparagus from Taiwan. The company has experienced difficulties in securing products from Taiwan and is seeking new suppliers. Current requirements are six containers (240,000 lbs.) per year. Mandalay would be interested in the import of canned all-green as well as white from Thai exporters but was unable to estimate annual requirements.

Reese Finer Foods, Inc., New Jersey. This company is one of the principal gourmet importers serving consumer markets. It buys canned, private-labeled white asparagus from Taiwan. Annual requirements are six containers, 240,000 lbs.

Universal Foods Corporation, New Jersey. This company is a major gourmet canned food importer and wholesaler for consumer markets and suppliers of imported and domestic canned foods to the institutional trade. It has traditionally imported private-labeled, white asparagus from Taiwan but recently has experienced difficulties in getting supplies and is seeking new suppliers. Requirements for white asparagus are about 10 containers a year (400,000 lbs.) primarily for the institutional market.

The company also supplies canned all-green asparagus to the institutional trade in substantial quantities. It expressed a strong interest in considering imports of all-green from Thai exporters.

Dae-Julie, Inc., Illinois. This is a large importer and supplier of institutional markets. It is actively seeking new suppliers of both privately labeled white and green asparagus. While declining to give requirements for competitive reasons, they are significant.

Pacific Sales, Ltd., Washington. This is an importer/exporter of processed fruits and vegetables for the institutional trade with national distribution. It primarily handles frozen products. It is seeking suppliers of all-green asparagus, private labeled, 2 1/2 lb. package/12 to the case. Current target, C & F West Coast price, \$2/lb. It does not currently import so was unable to estimate its total annual requirements but initial requirements will be four containers a month, almost 2,000,000 lbs. a year.

(d) Gourmet/Oriental Specialties:

Water chestnuts, bamboo shoots, baby corn

In the U.S., water chestnuts, bamboo shoots and baby corn are considered to be commodities for the gourmet and oriental ethnic market. The marketing system for the commodities is essentially the same for all three with importers often handling all of them. For a number of importers the quantity of each commodity required per shipment is less than a container-load and mixed containers are purchased. Availability of all three commodities in the source country, in this case Thailand, will be a significant market development consideration. The commodities are considered together in this section rather than being treated separately.

Structure of the Market. There are three distinct markets for the commodities -- manufacturers of oriental foods, institutions and consumers.

Manufacturers purchase water chestnuts and bamboo shoots, but no significant quantities of baby corn, for further processing into institutional and consumer pack oriental food products. The largest manufacturers import directly while smaller ones purchase from importers. Few, if any, import or purchase the commodities in bulk and repackage into institutional or consumer packs for resale in the form in which imported.

Commodities destined for the institutional market are purchased by a number of importers, often private-labeled by the supplier in the country of origin. Some handle consumer-pack commodities as well.

Consumer-pack commodities are imported by a number of importers/wholesalers, the largest with national distribution to chains and regional brokers. Products are normally private-labeled by suppliers. Principal importers specialize in serving gourmet markets characterized by a wide diversity of products with relatively low volumes. Del Monte directly imports private-labeled, consumer-pack water chestnuts and bamboo shoots and wholesales them nationally.

Water Chestnuts

Market Demand. While all water chestnuts, bamboo shoots and baby corn are imported, quantities relative to all U.S. food product imports are insignificant and they are not separately reported in import statistics.

Demand for consumer-pack water chestnuts is approximately 1,500,000 cases a year (12,000,000 lbs. with the normal case packs). This estimate was derived from analysis of actual case deliveries and was confirmed by principal suppliers.

No estimate of the overall demand for manufacturing and the institutional market was available. However, from the requirements of Del Monte (the largest manufacturer) and others, it is considerable.

Source of Supply. Principal source for water chestnuts has been, and continues to be, Taiwan. During the past several years China has commenced supplying the U.S. and other markets. Thailand has recently started to supply some markets.

There is currently a substantial surplus supply of water chestnuts. The consensus is that the quality of water chestnuts from China is superior to those currently supplied by Taiwan; the quality of the Taiwan product having deteriorated during the past several years. However, a number of buyers interviewed have experienced problems buying from China. For example, one with an annual requirement of over 1,000,000 lbs. of consumer-pack product is of the opinion that China is not a reliable supplier; another indicated that China is not interested in private labeling. Another major manufacturer does not buy consumer-pack from China because of lack of adequate cooking retort records for consumer quality and safety.

Those interviewed believed that there is an existing opportunity for Thai processors to become substantial suppliers to the U.S. market. The position of Taiwan as the principal traditional source of supply appears to be vulnerable. And while China will no doubt continue to be a major factor in the market in the future, buyers always desire alternative suppliers. If Thailand is to be considered as an alternative, pricing must be competitive and product quality equal to China's. Good quality labels for private labeled consumer-packs must be available.

Prices. The prices received by suppliers fluctuate from year to year based upon supply and demand. According to one importer, the current price for consumer pack with the existing surplus is about 40% lower than it was a year ago. Prices are quoted by the case and price ranges currently quoted are:

	<u>FOB Taiwan/China US\$/Case</u>	<u>CIF U.S. West Coast US\$/Case</u>
	<u>Range</u>	<u>Range</u>
. Consumer pack, pvt. label, 8 oz. can/ 24 to case	(est) 4.50-5.40	5 - 6.00
. Institutional and manufacturing, No. 10 can/6 to case	15-17.00	(est) 16.40-18.85

Tariff and Import Considerations. Current rates of duty for water chestnuts are:

TABLE 11
U.S. Tariffs on Processed Water Chestnuts from Thailand

Schedule Number	Commodity	Rate of Duty
138.40	Frozen water chestnuts	Free
141.70	Water chestnuts in airtight containers	Free

Source: Tariff Schedule of the U.S. (Annotated) 1982

For other import considerations, refer to prior comments in the tropical fruit puree section.

Product specifications and packaging. There are no established product specifications for water chestnuts. Both whole and sliced water chestnuts are imported and dependent on the marketing requirements of the importer. In the California consumer market, 64% of all cases delivered to retail outlets in the past year were whole, the balance sliced.

Quality considerations of chestnuts were crisp texture, white color, well-peeled, no spots, and properly retorted. Del Monte, the major manufacturer and a principal importer of consumer pack, requires adequate retort records for the consumer-pack product but not for manufacturing products. With the latter, the product is cooked during manufacture and suppliers' retorting is not as critical.

Most consumer-pack products are canned rather than bottled. The usual pack is 8 or 8 1/2 oz. cans, 12 or 24 to the case; a relatively small quantity is packed in 5 or 6 oz. cans.

All manufacturing and institutional products are packed in No. 10 cans/6 to the case.

Consumer-pack and products destined for the institutional market are usually private-labeled by the supplier. Quality of the label is an important consideration, particularly for consumer-pack products.

Specific Importers Identified. During the course of the study the following prospective purchasers indicating an interest in considering Thai suppliers of water chestnuts were identified and interviewed. All buy only in container loads with L/C terms.

Universal Foods Corporation, New Jersey. This is a major importer and distributor of a wide range of gourmet foods, including water chestnuts, bamboo shoots and baby corn, both consumer and institutional pack. Requirements for all three commodities average eight containers a year, about 320,000 lbs., with water chestnuts being the largest volume.

JFC (Japan Food Company), California. This is an importer and national distributor of oriental food products, reportedly the largest in the United States with eight offices throughout the country. It handles over 4,000 consumer-pack products, including the three being considered here as well as canned lichees and others. It supplied 20% of the case deliveries to retail stores of consumer-pack water chestnuts in California the past year. Water chestnut requirements are approximately 55 containers a year, 2,200,000 lbs. Label quality is of great importance. Annual contracts are let in October of each year.

Reese Finer Foods, New Jersey. This is a major importer and distributor of gourmet foods from around the world, including the three commodities considered here. It has been buying water chestnuts from Taiwan and has just commenced buying from Thailand. The company does not regard China as a dependable supplier. Annual consumer pack requirements for water chestnuts are 35 containers, 1,400,000 lbs.

Del Monte Corporation, California. This is the major manufacturer of oriental food products in the U.S., as well as being a major importer and distributor of consumer-pack water chestnuts and bamboo shoots. It supplies 32% of the California consumer market for water chestnuts. It purchases all of its consumer-pack products from Taiwan, as well as some products for manufacturing. It buys products for manufacturing from China and Thailand. Annual requirements for consumer-pack is 450,000 cases, 3,840,000 lbs., for manufacturing 30-35,000 cases, 1,600,000 lbs.

Pacific Sales Ltd., Washington. This is an importer and exporter of processed fruits and vegetables serving primarily institutions. It is not currently importing water chestnuts but is seeking reliable competitive suppliers. Initial requirements are 24 containers a year, 960,000 lbs.

The company is also seeking a supplier of frozen pea pods, with and without water chestnuts, consumer and institutional pack. Samples from Taiwan have not met quality specifications. Annual requirements are estimated to be 24 containers, 960,000 lbs.

Bamboo Shoots

Market Demand. The estimated annual demand of consumer-pack bamboo shoots is 500,000 cases, 6,000,000 lbs. In California, Del Monte supplied 39% of the market, and Japan Food Company 17% in 1982. No estimates of the overall demand for manufacturing and the institutional trade are available.

Source of supply. As with water chestnuts, Taiwan is the principal source for bamboo shoots. China is supplying some, primarily for manufacturing and institutions. And recently Thailand has commenced supplying U.S. manufacturing and institutional markets. Consensus of those consulted was that there is a good opportunity for Thai processors to significantly increase their share of the market.

Prices. Prices fluctuate in response to supply and demand. Current prices quoted are:

	<u>FOB Taiwan US\$/Case</u>
. Consumer pack, 8 oz./24 to case	\$5-6
. Manufacturing/institutional pack, No. 10 cans/ 6 to case	\$14-15

The average prices will probably serve as a good target price for Thai processors at the current time.

Tariff and Import Considerations. Tariff rates on bamboo shoots are set forth in Table 11.

TABLE 12
U.S. Tariffs on Processed Bamboo Shoots from Thailand

Schedule Number	Commodity	Rate of Duty
138.40	Frozen bamboo shoots	Free
141.78	Bamboo shoots in airtight containers	Free (Normal duty of 9% ad valorem temporarily suspended until 6/30/83.)

Source: Tariff Schedule of the U.S. (Annotated) 1982.

For other import considerations, refer to prior comments in tropical fruit puree section.

Product specifications and packaging. There are no established product specifications for bamboo shoots.

Quality considerations of the processed product mentioned were a creamy white to golden yellow color, even regular slices, not odd-shaped slices, and adequate retorting.

Consumer-pack bamboo shoots, whole or sliced, are canned or bottled and private-labeled by the supplier. The usual pack is 8 - 8 1/2 oz. cans/12 or 24 to the case. Manufacturing and institutional packs are No. 10 cans/6 to the case. Bamboo shoots for manufacturing are normally sliced to the specifications of the buyer while those for the institutional trade may be either whole or sliced. Label quality for consumer pack product is of considerable importance.

Specific Importers Identified. During the course of the study the following prospective purchasers indicating an interest in considering Thai suppliers of bamboo shoots. All buy only in container loads on L/C terms.

Universal Foods Corporation, New Jersey. It currently buys from Taiwan. Requirements for water chestnuts, bamboo shoots and baby corn average 8 containers a year, 320,000 lbs. It purchases both consumer and institutional pack, private-labeled.

Japan Food Company, California. The company only handles consumer-pack, sliced bamboo shoots, private-labeled by suppliers. Traditionally it has bought from Taiwan but has recently commenced purchasing from China. Annual requirements are 85,000 cases, 720,000 lbs. It lets annual contracts in October of each year.

Reese Finer Foods, New Jersey. It buys both consumer and institutional pack bamboo shoots, private-labeled, from Taiwan. Its annual requirements average 14 containers, 560,000 lbs. The company also supplies Japanese buyers and stated that the demand there was "ten times greater than that of the U.S."

Del Monte, California. The company buys consumer-pack bamboo shoots, private-labeled, from Taiwan; bamboo shoots for manufacturing are purchased primarily from Taiwan but it is developing suppliers in China and Thailand. Annual requirement for consumer-pack is 200,000 cases, 1,720,000 lbs. For manufacturing, requirements are 30,000 cases, 1,400,000 lbs. The total bamboo shoot requirement for Del Monte is 3,120,000 lbs.

Mandalay Food Products Corp., California. It only handles institutional pack bamboo shoots. Its annual requirements average 3 containers, 120,000 lbs.

Baby Corn

Market Demand. There are consumer-pack and institutional markets for baby corn, but no demand for manufacturing. Del Monte does not purchase baby corn. The consensus was that there are only limited markets for baby corn, much smaller than those for water chestnuts and bamboo shoots. No estimate of market size is available. Deliveries of baby corn are not separately reported in import statistics or the retail store case delivery statistics analyzed, tending to confirm limited demand.

If considered separately, there appears to be little market development potential in the U.S. for baby corn. However, a number of importers of water chestnuts and bamboo shoots order mixed containers of those two products as well as baby corn. In a number of cases, availability of all three may be an important factor in selling any one of the three products. Thus baby corn should be included in the market development program to assure the broadest target market possible.

Sources of Supply. Taiwan is the principal source country for both consumer and institutional pack product. One importer consulted is purchasing some from Thailand.

Prices. Prices fluctuate in response to supply and demand. There is currently a supply surplus. Current institutional pack prices quoted are:

	FOB Taiwan US\$/Cs.
<u>Institutional, No. 10/6 to case.</u>	
Whole	\$12-14
Cut	\$8.50

Tariff and Import Considerations. Tariff rates for baby corn are:

TABLE 13
U.S. Tariffs on Baby Corn from Thailand

Schedule Number	Commodity	Rate of Duty
141.83	Corn on Cob	15.6% ad valorem

Source: Tariff Schedule of the U.S. (Annotated) 1982.

For other import considerations, refer to prior comments in the tropical fruit puree section.

Product Specifications and Packaging. There are no established specifications for canned or bottled baby corn; the commodity is not imported or marketed frozen.

The usual consumer pack is either a 7, 8, or 15 oz. can or bottle, 24 to the case. Often bottling rather than canning is preferred; visual appeal of the product to consumers is regarded as a positive marketing factor. Most products are imported private-labeled; label quality is important. Only whole ears are consumer-packed.

Baby corn for the institutional market is marketed both whole and cut. Size of ears is a consideration, specified in terms of count per can, 110-130, 130-150, or 150-180. Most are private-labeled by suppliers. The institutional pack is No. 10 cans/6 to the case.

Specific Importers Identified. The following prospective purchasers, all indicating an interest in considering Thai suppliers of baby corn, were identified and interviewed.

Japan Food Company, California. The company only handles consumer-pack products. It could not estimate its requirements since it was just starting to market the product.

Mandalay Food Products Corp., California. The company only imports institutional-pack baby corn, one container, 40,000 lbs. a year.

Reese Finer Foods, Inc. The firm's requirements are six containers, 240,000 lbs. a year of consumer-pack, private-labeled product.

Universal Food Corporation, New Jersey. This company imports institutional pack baby corn, both whole and cut. Annual requirements are 1-2 containers a year, 40-80,000 lbs.

4. Developing U.S. Markets

In order to capitalize on the market development potential identified in this study, to establish and maintain supply arrangements with importers, Thai processors/exporters will have to pursue an effective market development program.

An important consideration with regard to such a program in the U.S. is that buyers prefer to have at least two source countries of the same imported product to insure competitiveness and continuity of supply. Thus, even though China or Taiwan may be the principal source of a particular commodity, purchasers will still buy substantial quantities from other countries if available.

In the U.S., Thailand is not recognized generally as a source or potential source of processed fruits and vegetables other than pineapples. It is regarded as a good, reliable source of pineapples. Thai processors/exporters will have to establish and maintain a comparable reputation for the supply of other food products which should be a major initial objective of the development program.

In order to achieve this objective, Thai processors/exporters will need to supply products of the quality required by buyers, in the volumes required at

competitive prices and on a reliable basis. Initially the Thai firms will have to convince prospective purchasers of their capabilities, competitiveness and reliability. After initial penetration of the market, performance will determine the success of the firms and Thailand as a reliable source of products.

Most potential U.S. buyers will expect Thai firms to initiate the dialogue on supply, rather than their searching out new suppliers in an unfamiliar source country. Each processor will have to aggressively pursue an affirmative marketing program to develop the U.S. market for its products. Just waiting for U.S. purchasers to come is unlikely to be a successful strategy in most cases.

Thailand Trade Promotion offices are established in New York and Los Angeles for the promotion of export of all types of Thai products, to assist exporters and those desiring to buy from Thailand. Assessment of the effectiveness of the programs of such offices was beyond the scope of this study. The role that trade promotion offices can perform in the U.S. is perhaps more limited than in other countries where consultation with such offices is more common. Trade offices can provide valuable assistance to Thai exporters in regard to market development. Conduct of general industry promotional programs, etc., such as a program for processed foods would be an appropriate function. However, trade offices are not in a position to act as the representative of a particular Thai company for development of trading or commercial relations with a particular importer.

Continuing personal contact and followup with prospective purchasers in the U.S. by the Thai firms or their representatives will be an important factor in successful establishment of supply arrangements, whether the buyer is an importing wholesaler, chain or manufacturer. Because of distance and costs, it is probable that most Thai firms will need to secure qualified market development assistance in the U.S. for performance of the function.

A U.S. representative will have to be familiar with the interests and capabilities of the Thai firm. Its principal involvement will be in the establishment of markets, rather than engaging in continuing trading activities, although a continuing liaison role with purchasers might be found useful in a number of cases.

Among the activities which a representative could perform for the Thai firm would be:

- . Continuing identification of prospective U.S. purchasers or additional commodities with substantial market development potential;
- . Marketing the capabilities and reliability of the Thai firm to prospective buyers;
- . Securing the product, packaging and other requirements of buyers; as appropriate, securing samples of products meeting those requirements for the guidance of the Thai firm;
- . Arranging for the delivery of product samples by Thai firms to prospective buyers (the normal buying practice in the U.S.);
- . Locating and arranging for production or packaging assistance which Thai firms may require;
- . Securing initial orders;
- . Monitoring product prices and relevant market developments;
- . Liaison as required; arrangements for visits by Thai firms to the U.S. and U.S. buyers to Thailand.

D. Japanese Market Development Potential

1. Introduction.

Japan, located in the temperate zone, has four distinct growing seasons. It produces a large variety of fruit and vegetable crops, both cool weather fruits such as apples and warm season crops such as pineapples and oranges. Fresh and processed tropical fruits such as papayas, mangoes, avocados, and guavas have only been imported by Japan since 1970. Tropical fruits still only represent a small share of the total fruit market.

A wide range of vegetables are produced in Japan. Included are root vegetables, leafy and fruit-type vegetables, and many types of beans. Due to expansion of controlled environment production, many vegetables are available throughout the year.

The consumption of processed vegetable products in Japan during the five-year period from 1973-1977 is shown in Table 14. With the development of the Japanese economy and improvement of the distribution system, the demand for processed fruits and vegetables is increasing. Particularly significant increases in the consumption of frozen vegetables and tomato products occurred during the period.

TABLE 14.
Consumption of Processed Vegetables Products in Japan
(Unit - MT)

Year	Canned Vegetables	Frozen Vegetables	Dried Vegetables	Processed Tomato Products	Pickled Vegetables	Total
1973	144,803	70,362	14,161	212,089	826,277	1,267,692
1974	156,117	112,929	14,234	235,139	829,831	1,348,250
1975	150,661	78,161	15,740	266,929	840,655	1,352,146
1976	157,879	112,049	19,717	273,399	870,713	1,433,757
1977	177,469	147,197	18,074	317,469	879,986	1,540,195

1 (Consumption = Domestic Production + Imports - Exports)

Source: Access to Japan's Import Market Vegetables, JETRO, 1980.

a) Sources of Processed Commodities. Tropical fruits and cashews are imported, none being produced in Japan. Domestic production, exports and quantities distributed in Japan of selected vegetables for the 1973-78 period are set forth in Appendix D. The difference between the quantities distributed and domestic production less exports, represents the volume of imports.

b) Marketing Channels. The structure of the Japanese marketing system is complex. Distribution channels for imported processed commodities are outlined in Table 15.

Marketing channels for Thai exporters, prospective importers/purchasers of processed fruits and vegetables, are identified at the top of the diagram: importers, import/export trading houses, wholesalers, large department stores, and larger processing companies. Most of these import a variety of commodities rather than specializing in a particular type of commodity or commodities processed in a particular form.

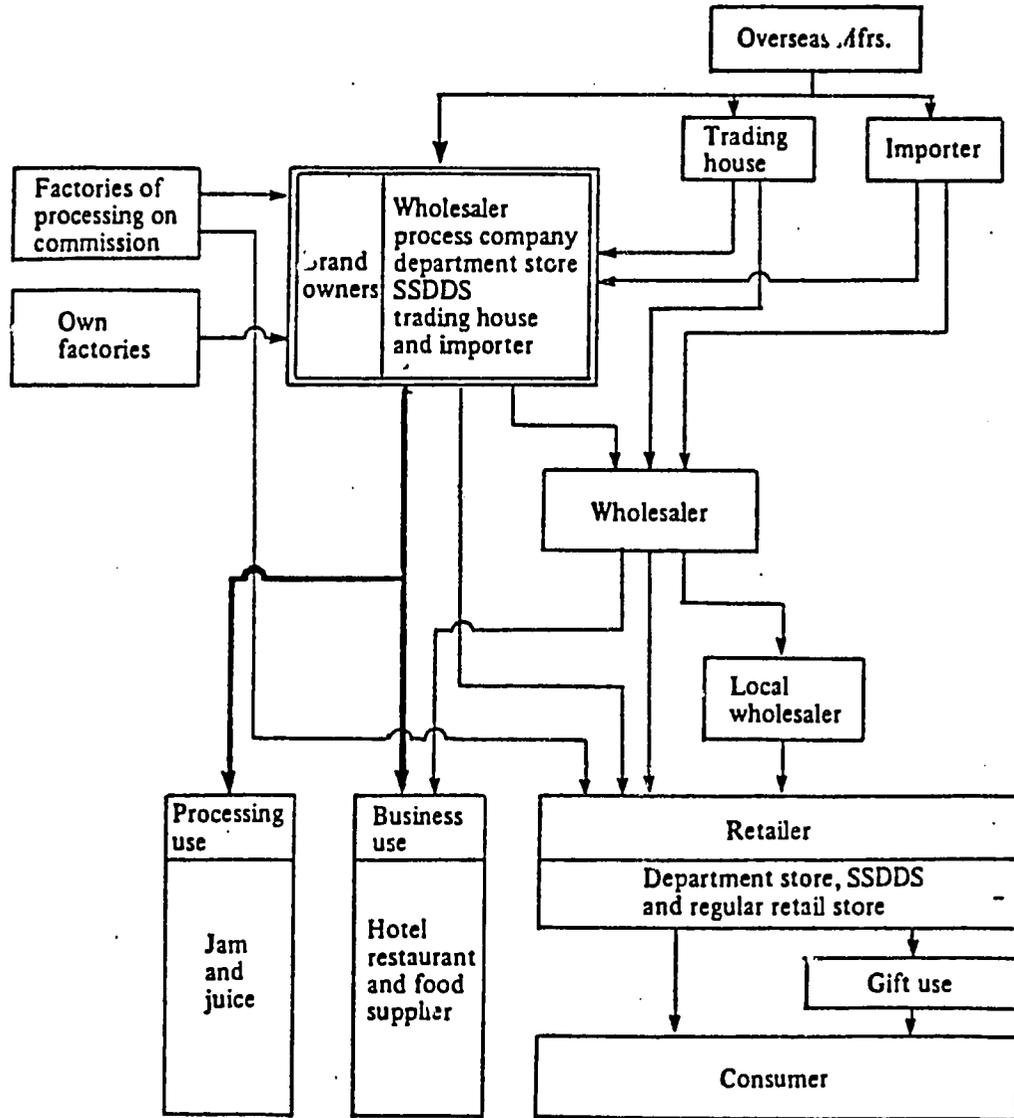
The Japanese market is highly brand-conscious. A number of internationally traded brands are well-established in the marketplace. Most other processed consumer products are private-labeled by suppliers with brands owned by the importing marketing organization or by importers or trading houses representing brand owners.

An estimated 100 organizations import processed fruits and vegetables. Over 87,000 wholesalers deal in foods and beverages, 13.6% of whom distribute processed foods. There were 735,100 retail food stores handling foodstuffs and beverages, including 232 department stores and 6,389 supermarkets. Although supermarkets make up less than 1% of the retail stores, they account for 23% of total sales.

Imported tropical fruit products, attractively packaged, are regarded as desirable and appropriate gifts in Japan. Cost, relative to other foods is high, and quality fruit and packaging is required. A substantial volume of imports are directed at this market which is served by a number of specialty "gift" stores as well as other retail outlets.

TABLE 15

Distribution Channels for Imported Processed Fruits and Vegetables



Source: The Distribution Systems Research Institute, Japan.

The institutional market in Japan is large, described as the "ten trillion yen industry." The industry is divided into two sectors, food and meal service with 75% of sales and the drink and food sector with 25%. The meal service sector is further subdivided into the commercial food preparation and service category which caters to the restaurant trade, about three-fourths of sales volume, and the group service which primarily serves schools, factories, hospitals and similar organizations. Approximately 31% of all restaurant sales involve processed foods.

c) Principal Sources of Data and Opinions Utilized. Important published sources of data were Japanese import statistics 1978-81, publications of the Japanese External Trade Corporation (JETRO) with respect to food distribution, food processing, vegetables, canned fruits and tropical fruits in Japan. Among the organizations consulted were JETRO, the Thai Trade Counselor in Tokyo and importers marketing processed fruits and vegetables.

d) Tariff and Import Considerations. Duty rates for important canned fruits are shown in Table 16, for fresh and dried fruits and nuts in Table 17, and for fresh and processed vegetables in Table 18.

Japan imposes quotas on imports of a number of products. See Table 19 for fruits and vegetables currently subject to quota restrictions. Assignment of a quota and prior approval is required before import of those products is permitted.

TABLE 16
Tariff on Major Canned Fruits

Code No.	Commodity	General	GATT	Temporary	Preferential	Reference
		%	%	%	%	
2006-1	Canned fruit (over 10 kg per piece)					
(1)	Pineapple	45	TR 30	55	—	IQ item
(2)	Peach (except for pulp)	35	(G under 10kg 27 KR 25) TR (over 2kg 15 others 18)	20	—	
	Pear (except for pulp)	35	(G under 10 kg 27 KR 25) TR 18	20	—	
	Cherry	35	KR 25	20	—	
	Banana, avocado, mango, guava, mangosteen	35	—	28	15	
2006-2	Canned fruit (others)					
(1)	Pineapple	45	—	55	—	IQ item
(2)	Peach and pear (except for pulp)	25	KR 20 TR 35 pear 15	16	12	
	Cherry (under 10 kg) (except for pulp)	25	G 20	16	12	
	Banana, avocado, mango, guava, mangosteen	25	—	20	15	—

Notes: TR: Final concessional rate in Tokyo Round
 KR: Concessional rate in Kennedy Round
 G: GATT concessional rate other than in KR and in TR

SOURCE: Access to Japan's Import Market - Canned Fruits. JETRO 1982

Note: In the assessment of a duty, a preferential rate is applied before a GATT rate, a GATT rate before a temporary rate, and a temporary rate before a general rate. However, if a GATT rate is not lower than other rates, the applicable rate is a temporary rate, or if no temporary rate is provided, a general rate. Preferential rates primarily apply to developing countries such as Thailand.

TABLE 17

Tariff on Fresh/Dried Fruits and Nuts.

Heading No.	Description	Import System	Date of Release	Rate of Duty			
				General	GATT	Preferential	Temporary
08.01	Dates, bananas, coconuts, Brazil nuts, cashew nuts, pineapples, avocados, mangoes, guavas and mangosteens, fresh or dried, shelled or not:			%	%	%	%
	1 Bananas:						
	(1) Fresh	AA	April, 1963				
	*[1] If imported during the period from 1st April to 30th September . . .			(30)			40
	*[2] If imported during the period from 1st October to 31st March . . .			(30)		45	50
	(2) Dried	AA	Oct. 1961	(20)	(10)	Free	10
	2 Pineapples						
	Fresh	AA	Oct. 1961	20			
	Dried	AA	Oct. 1961	20		10	
	3 Dates						
	Fresh	AA	Oct. 1960	(20)			Free
	Other	AA	April 1970	(20)			Free
	4 Other						
	Coconuts	AA	Fresh Oct. 1960	(20)	(10)	Free	10
	Brazil nuts	AA	Dry Oct. 1959	(20)	(10)	Free	10
	Cashew nuts	AA	Oct. 1959	20	5		
	Other, fresh	AA	Oct. 1959	(20)	(10)		10
	Other, dried	AA	Oct. 1959	(20)	(10)	Free	10
	Mango, Avocado, Guava, Mangosteen . .	AA					
08.02	Citrus fruit, fresh or dried:						
	1 Lemons and limes	AA		20	10		
	2 Oranges:	IQ					
	(1) If imported during the period from 1st June to 30th November			20			
	(2) If imported during the period from 1st December to 31st May			40			

SOURCE: Access to Japan's Import Market - Tropical Fruits.
JETRO, 1980

Heading No.	Description	Import System	Date of Release	Rate of Duty			
				General	GATT	Preferential	Temporary
08.02	3 Grapefruit	AA	Jun. 1971	%	%	%	%
	*[1] If imported during the period from 1st June to 30th November . .			(20)			20
	*[2] If imported during the period from 1st December to 31st May			(20)			40
	4 Other						
	Tangerines and mandarins	Tangerines IQ	Oct. 1961	20			
Other	Mandarins AA AA	oct. 1961	20				
08.03	Figs, fresh or dried:						
	1 Fresh	AA	Oct. 1960	(20)			10
	2 Dried	AA	April 1960	(20)	10	5	
08.04	Grapes, fresh or dried:						
	1 Fresh	AA	European Jan. 1971 Others April 1962 Jan. 1961	20			
	2 Dried	AA					
	*[1] In can, bottle or pot, not more than 10kg each including container . . .			(20)	(10)	5	10
	*[2] Other			(20)	(5)		5
08.05	Nuts other than those falling within heading No. 08.01, fresh or dried, shelled or not:						
	1 Chestnuts	AA	Oct. 1961	20			
	2 Walnuts	AA	Oct. 1962	30			
	3 Bitter almonds and betel nuts	AA	Oct. 1961	Free	(Free)		
	Bitter almonds						
	Betel nuts						
	4 Other						
	*[1] Sweet almonds	AA	Oct. 1960	(20)	(9)	5	9
	*[2] Hazel nuts	AA	Oct. 1961	(20)	(10)	5	10
	Other			20			

TABLE 18

Tariff on Fresh and Processed Vegetables

Code No.	Description	Rate of Duty (%)			
		General	GATT	Temporary	Preferential
0701-100	Potatoes (Fresh/Chilled)	10	5	-	-
0701-200	Tomatoes (Fresh/Chilled)	10	5	-	-
0701-310	Onions (Fresh/Chilled)	10	-	Note:	-
0701-320	Garlic (Fresh/Chilled)	10	5	5	-
0701-330	Other (Leek, Shallots)	10	5	5	-
0701-410	Lettuce (Fresh/Chilled)	10	5	5	-
0701-490	Other Vegetables (Fresh/Chilled)	10	5	5	-
0703-010	Peas (Frozen)	10	-	-	-
0703-020	Beans (Frozen)	10	-	-	-
0703-090	Frozen Vegetables (Other)	10	-	-	-
0703-010	Small Eggplant, Smilax (Previously Frozen)	15	-	10	-
0703-020	Brussels (Previously Frozen)	15	-	10	-
0703-090	Other Vegetables (Previously Frozen)	15	-	-	-
0704-010	Bamboo Shoots (Dried)	15	-	-	7.5
0704-010	Onions (Dried)	15	-	-	-
0704-040	Flowering Fava (Dried)	15	-	-	10
0704-090	Other Vegetables (Dried)	15	-	-	10
0705-300	Corn Beans (Dried)	0	0	-	-
0800-000	Berry (Fresh)	20	10	-	-
0800-010	Melon (Including Melon seeds) (Fresh)	20	-	10	-
0800-090	Other Fruits (Fresh)	20	-	10	-
0910-300	Ginger (Sub-Frozen)	15	-	-	-
0910-311	Ginger (put in to container for export)	20	10	-	0
0910-321	Ginger (Ungrated)	10	5	5	0
0910-334	Ginger (Ground)	15	5	5	0
2003-190	Vegetable Prepared (Sugar)	25	-	20	17.5
2003-211	Tomato Paste (Not Sugar)	25	25	-	-
2003-212	Tomato Paste (Not Sugar)	25	25	-	-
2003-220	Processed Tomatoes (Non-Sugar)	25	15	15	9.5
2003-231	Asparagus (Canned/Bottled)	25	20	10	-
2003-239	Processed Asparagus (Other)	25	-	20	-
2003-240	Processed Bamboo Shoots	25	-	20	-
2003-261	Fresh Mushrooms (in Airtight Containers)	25	-	20	-
2003-271	Garlic Powder (in Airtight Containers)	25	-	20	15
2003-279	Garlic Powder (Other)	25	17.5	14	10
2003-281	Processed Green Peas	25	25	20	10
2003-291	Processed Other Vegetables (in Airtight Containers)	25	20	10	15
2003-299	Processed Other Vegetables (Other)	25	15	15	-
2007-211	Tomato Juice (Sugar)	35	-	-	-
2007-212	Mix Juice (Sugar)	35	17	15.5	12
2007-219	Other Vegetable Juice (Sugar)	35	17	15.5	12
2007-221	Tomato Juice (in Airtight Containers, Non-Sugar)	25	25	-	-
2007-222	Tomato Juice (Not Sugar, Other)	25	-	-	-
2007-223	Mix Juice (Non-Sugar, in Airtight Containers)	25	17	-	12
2007-224	Mix Juice (Not Sugar, Other)	25	17	15.5	12
2007-229	Other Vegetable Juice (Non-Sugar, in Airtight Containers)	25	17	-	12
2007-229	Other Vegetable Juice (Non-Sugar, Other)	25	17	15.5	12
2104-111	Tomato Ketchup	25	25	-	-
2104-112	Tomato Sauce	25	20	-	-
2107-111	Vegetable Soup (in Airtight Containers, Sugar)	30	-	21	17
2107-112	Vegetable Soup (in Airtight Containers, Non-Sugar)	30	17	15.5	10
2107-213	Processed Sweet Corn (Sugar)	25	-	-	-
2107-223	Processed Sweet Corn (Frozen)	25	-	-	-
2107-228	Processed Sweet Corn (Non-Sugar)	25	-	-	-
2107-231	Processed Young Corns (Non-Sugar)	25	-	-	10

Source: Access to Japan's Import Market - Vegetables. JETRO, 1980

TABLE 19
Fruits and Vegetables Subject to Import Quotas in Japan
(March, 1982)

Heading No. of Customs Tariff Schedule	Description of Goods
07.05-1 ex07.05-2 ex07.05-4	Small red beans Broad beans and peas, excluding seeds for growing vegetables (see item 7 of paragraph III below) Other dried leguminous vegetables, excluding seeds for growing vegetables (see item 7 of paragraph III below)
ex08.02-2 ex08.02-4 ex08.11-2	Oranges, fresh Tangerines, fresh Oranges, provisionally preserved by sulphur dioxide gas or other preservative gases
ex20.05 20.06-1-(1) ex20.06-1-(2) 20.06-2-(1) ex20.06-2-(2)	Fruit puree and fruit pastes Pineapples containing added sugar or spirit Fruit pulps containing added sugar or spirit, excluding fruit pulp of apricots or of nuts Other pineapples, prepared or preserved Other fruit pulps, excluding fruit pulp of apricots or of nuts.
ex20.07-1-(1) ex20.07-1-(2)	Fruit juices added with sugar, excluding lemon juices Other fruit juices, excluding sloe bases, lemon juices and lime juices
ex20.07-2 21.04-1-(1)	Tomato juices, the dry weight content of less than 7% Tomato ketchup and tomato sauce

e) General Comments on the Japanese Market. In contrast to U.S. business practice, Japanese importers commonly seek out new suppliers and work closely with trade development organizations. They normally seek to establish longer-term, continuing supply relationships rather than just another source to compete with other suppliers. All specific prospective purchasers identified in the study are currently working with Thai processors to develop such relationships. Because of the foregoing, Japanese importers are reluctant to provide specifics on their requirements.

2. Study Commodities with Little Development Potential.

Processed commodities found to have little market development potential for Thai exporters were:

Bananas, mangoes, rambutans, rambutans with inserted pineapple, lichees, papayas and longans. None of these fruits are produced in Japan with the exception of some pineapples. Processed imports are not separately reported, but are included in broad categories with a variety of fruits. No substantial volumes of imports are reported for any of the categories, leading to the conclusion that there is no significant development potential for Thai exporters. Those consulted concurred.

Substantial quantities of fresh fruits are imported, including papayas from the U.S., mangoes principally from the Philippines and Mexico, and some mangosteens from Mexico. Investigation of the potential for Thai exporters of fresh fruit was beyond the scope of this study, but there is an apparent development opportunity which warrants further investigation. (Pests, such as the melon and oriental fruit flies, however, which are prevalent in Thailand are a detriment to increasing exports of fresh tropical fruits to Japan.)

Canned mushrooms. Demand for canned mushrooms is large. Imports in 1981 were 10,300,000 kgs., primarily from South Korea, China and Taiwan, of which 67% were described as "French" mushrooms. Straw mushrooms is highly competitive. (See comments in the U.S. market section.) It was concluded that there is little market development potential in Japan for Thai exporters for canned mushrooms.

Cow peas, sugar peas. Imports of these commodities are not separately reported, nor is production quantity in Japan. There appears to be no significant demand for these commodities in any form.

Asparagus. Japanese production of canned asparagus was 10,731,000 kgs. in 1981. Imports were 1,500,000 kgs, 80% supplied by Taiwan. With the long

association of Japan with Taiwan as a supplier and Taiwan's proximity to Japan, there appears to be little development potential for Thai exporters in the supply of canned asparagus to Japan.

Cashew nuts. While still substantial, Japan's imports of both processed and unprocessed cashews have declined steadily over the past five years, 50% for the unprocessed and 75% for the processed. Thailand supplied 0.4% in 1981, none previously. The market is highly competitive. (See comments with respect to cashew in the U.S. Hong Kong and Singapore sections.) There is little development potential for supply of cashews to the Japanese market.

3. Study Commodities with Substantial Development Potential.

The following commodities were found to have significant development potential for Thai exporters. Specific importers are identified at the conclusion of this section.

a) Bamboo shoots. Two forms of this commodity are imported by Japan, canned and dried. Both offer development opportunities.

Canned bamboo shoots. Japanese demand increased from 60 to 80,000,000 kgs. per year during the 1973-78 period. More recent statistics are not available but it is assumed that the trend has continued. Domestic production remained constant at about 40,000,000 kgs. throughout the period.

Japan imported 26,253,730 kgs. in 1981, about the same quantity as in 1980 but 50% less than in 1978 and 1979. This leads to the conclusion that domestic production has increased in 1978 and continues at the higher rate. Taiwan supplied 92% of imports, continuing its position as principal supplier to Japan, China supplied 4% and Thailand 2%. Thailand increased its exports during the first nine months of 1982 to over 1,000,000 kgs., significantly larger than the 600,000 kgs. supplied during all of 1981. Average 1981 CIF import prices for the Taiwan product was Y189/kg. and for the Thailand product, Y104/kg.

There appears to be a substantial opportunity for Thailand to become a major supplier of canned bamboo shoots for the Japanese market, a conclusion of those consulted. Success in penetration of the market by exporters during the past several years tends to confirm this. While Taiwan has been the traditional supplier, the view was expressed that it is losing interest in maintenance of this position because of increasing land and labor costs. This was in accord with the consensus of those interviewed in the United States.

Supply of canned bamboo shoots by China is a significant market development consideration in the U.S. China does export some of the commodity to Japan but a reluctance to promote a significant increase in its share of the market can be sensed in discussions with Japanese firms. Others familiar with Japan share this view. If true, lack of Chinese competition will enhance the opportunity for Thai exporters.

To capitalize on the opportunity, exporters will have to be competitive in quality, price and reliability. According to those consulted in the U.S. and elsewhere, the quality of Chinese bamboo shoots is higher than that of Taiwan's product. The Japanese market demands the highest quality and exporters should seek to meet or exceed the product quality supplied by China.

Dried bamboo shoots. During the 1973-78 period, demand was about 4,000,000 kgs. a year. No significant quantities of dried bamboo shoots are produced in Japan. While the market for the dried product is much smaller than that for the canned product, it is still significant.

In 1981, 3,619,638 kgs. of dried bamboo shoots were imported with Taiwan supplying 96% and China 3%. Thailand supplied none. Average CIF price of the Taiwan product was Y1040/kg.

There is a market development opportunity for Thai exporters in the supply of dried bamboo shoots as well as canned. High quality, price competitiveness and reliability will be essential. Thailand currently supplies this commodity to Singapore and importers there reported that the products supplied were inadequately processed resulting in low quality. Quality improvement will be necessary for the Japanese market.

b) Mixed tropical fruit; fruit salad and fruit cocktail. Western and tropical fruit mixes are reported in one category of the import statistics, not separately. In 1981, 4,996,458 kgs. of canned mixed fruits were imported, a decrease of 20% from the prior year. Principal suppliers of Western fruit mixes were the U.S. and Australia, 82% of total imports.

Based upon further investigation, tropical fruit mix imports were 870,000 kgs. (16% of total fruit mix imports), Thailand 61,000 kgs. (1.2%) and Malaysia (0.5%). Average CIF price for the Philippine imports was Y208/kg., for Thai imports Y284/kg. The Philippines has been the traditional principal supplier. Malaysia entered the market for the first time in 1981. Thailand has supplied the commodity since 1977, with a high of 77,000 kgs. in 1979 followed by an unexplained drop to only 9,000 kgs. the following year.

Those consulted felt that there is an opportunity for Thai exporters to substantially increase their share of the market, focusing on the "gift market." To develop the opportunity, processors/exporters will have to work closely with Japanese importers to develop product blends for the market using the many tropical fruits available in Thailand. Establishment of adequate product and label quality is important. Blends of tropical fruits not used in the Philippine product acceptable to Japanese consumers could provide a competitive advantage for Thai exporters. To increase their share of the market, exporters will have to become price competitive with Philippine suppliers.

c) Canned baby corn. Domestic production of baby corn (called young Corncobs in Japan), some 332,900 MT in 1978, is marketed fresh. No significant quantity is canned.

1981 imports of the canned commodity were 1,981,163 kgs., 90% supplied by Taiwan and the balance by Thailand. Imports are not identified as being institutional or consumer pack. The two countries have traditionally supplied the market in about the same proportion. Average 1981 CIF prices for Taiwan imports were Y195/kg., for Thai imports Y308/kg. From Thai export statistics, the average FOB price was B25/kg. (Y equivalent 259).

According to importers consulted, most canned imports are for the institutional trade. Consumer packs are bottled rather than canned. Consensus was that there is significant opportunity for Thailand to increase its share of the market, concentrating on the supply of institutional packs. Becoming price competitive with Taiwan will be essential.

d) Specific Importers Identified. The following prospective purchasers of study commodities having development potential, all located in Tokyo, were identified:

Oriental Takase Corporation
Japan Vietnam Trading Co.
Tsurutani and Co., Ltd.
Tosin Co., Ltd.
SCT Co., Ltd. (Siam Cement)

4. Developing Japanese Markets.

Thai exporters will have to work closely with Japanese importers in development of the opportunities identified. Thailand's trade development program in Japan should emphasize promotion of Thailand as a source, and reliable supplier, of a wide range of fresh and processed fruits and vegetables.

Product and packaging requirements of the Japanese market are high. Thai processors will have to establish and maintain standards satisfying those requirements. Continuing price competitiveness will be necessary. The general reputation of Thai firms as reliable suppliers will be of substantial importance for each Thai exporter. Effective cooperation between Thai exporters to ensure the establishment and maintenance of a good reputation should be an important element not only of the Japanese market development program but also those for other markets investigated.

E. Singapore Market Development Potential

1. Introduction

The Singapore marketing system for the study commodities is generally described here.

a. Sources of Processed Commodities. There is no significant production of any of the study commodities in Singapore. They are imported from other countries, either as fresh produce or in processed form.

b. Marketing Channels. Fresh imports supply the domestic consumer and institutional markets, ship provisioning demand, Singapore processor raw material requirements and reexports of fresh produce to other countries.

Processed commodity imports, the majority canned, supply the Singapore domestic, institutional markets, and ship provisioner markets. Substantial quantities are reexported.

The Singapore consumer market is served by chains operating 116 supermarkets, 100 mini-supermarkets and 4,000 provision stores. Supermarkets market most consumer food products. Several chains are affiliated with similar operations in Hong Kong and other countries. Chains normally import processed commodities with any significant volume directly from other countries. Mini-supermarket operations usually buy from importers/wholesalers. Provision stores are supplied by smaller wholesalers who buy from importers.

Importers, several being affiliated with large export-import trading organizations with offices throughout Asia, handle a wide range of processed commodities for both the consumer and institutional trade. They supply chains, institutions and other wholesalers servicing smaller retail outlets and institutions.

Singapore is a center for ship provisioning and this represents an important segment of the institutional trade for both fresh produce and processed commodities. One hundred wholesalers in Singapore serve this market, either importing directly or purchasing from other large importers. Some of these wholesalers are affiliated with ship provisioning operations in Hong Kong and elsewhere.

Manufacturers of any substantial size will normally import raw materials - in fresh or processed form - directly. Importers will supply smaller manufacturers.

c. Principal Sources of Data and Opinions Utilized. Important published data sources consulted include Singapore import-export statistics for 1981, and eight months of 1982; Thai export statistics for 1981, and nine months of 1982; a 1981 study on the Thailand fresh and processed fruits and vegetables domestic and export industry; relevant publications provided by the Singapore Trade Development Office and the Thai Commercial Trade Commissioner in Singapore.

Among the organizations consulted were three processed commodity importers, including two of the largest in Singapore. One is affiliated with a trading and ship provisioning organization with other offices in Asia.

Two fresh produce importers and a major Singapore manufacturer of processed commodities were interviewed. The latter firm markets worldwide, throughout Asia, Japan, U.S. and Europe.

d. General Comments on the Market. Singapore itself is a small market of about 3,500,000 people, but it is an international trading center. Trading in both fresh and processed commodities for both the domestic and export market is highly competitive and those engaged in importing, exporting, and marketing were for the most part unwilling to provide specific information with respect to their requirements or competitive price ranges for commodities. Most Singapore buyers also felt that disclosure of their specific product quality and packaging requirements would affect their competitive position.

The Singapore consumer is highly brand-conscious. They primarily buy established brands and it is reportedly difficult to market new, unknown brands. Imported products are often private-labeled with established brands. This will be an important factor to be taken into account by Thai exporters in Singapore market development

2. Study Commodities with Little Development Potential

Processed commodities found to have little market development potential in Singapore were:

Bananas, cowpeas, asparagus, and sugar peas. It was concluded that there is no substantial market demand for these commodities processed in any form. Imports are not separately reported, indicating small volumes, and none of the publications or organizations consulted indicated any significant demand for the commodities.

Water chestnuts. Despite significant demand in other markets investigated, demand for processed water chestnuts appears to be small in Singapore. (Some undetermined quantities are consumed fresh which might account for the lower, processed commodity demand.). Imports are not separately reported and none of the sources consulted indicated any significant demand.

Processed guavas, mangoes, papayas. There are no substantial imports of canned/frozen/dried guavas, mangoes or papayas. No imports of processed papayas and guavas were reported in 1981. Imports of dried mangoes were 20,000 kgs.(none in 1980), 85% of which were supplied by India; 17,000 kgs. of canned mangoes were imported, 42% of which was reexported. There appears to be little market development potential for these processed commodities, a conclusion confirmed by those consulted.

Substantial quantities of fresh papaya were imported in 1981, primarily from the Malaysian Peninsula; 1,347,000 kgs. of fresh mangoes were imported. Thailand supplied 23% of fresh mango imports, down from 71% of a much larger quantity in 1980, Philippines 36%, Malaysian Peninsula 24% and India 8%.

Canned rambutans, rambutans with inserted pineapples. Singapore import statistics do not report rambutans and rambutans with inserted pineapples separately, both are included in one category. Canned rambutan imports are substantial. Singapore reported imports of 516,052 kgs., 95% supplied by Thailand, and exports of 41,985 kg. in 1981. Thailand reported exports of 67,142 kgs. of canned rambutans, and 717,544 kgs. of rambutans with inserted pineapple to Singapore that year. Reconciliation of the different quantities reported was beyond the scope of the study. Since Thailand already has the Singapore market, there is little apparent development potential.

Tropical fruit cocktail. Fruit cocktail imports into Singapore in 1981 exceeded 2,000,000 kgs. Tropical fruit products, as distinguished from fruit cocktail mix comprised of temperate-zone fruits, is not separately reported. Principal supplier was the U.S. Malaysia supplied 54,000 kgs. (presumably tropical fruits). There is a market for tropical fruit cocktail in Singapore but no estimate of its size was available.

The consensus of those consulted was that there is only limited development potential for Thai exporters. A primary reason is the nature of the consumer demand. Singapore consumers prefer "Western" fruits in cans and tropical fruits in the fresh form. Singapore is adjacent to Malaysia, and has

continuing close ties with that country. It is unlikely that Thai exporters could be successful in displacing Malaysia as principal supplier of demand for tropical fruit cocktail.

Canned baby corn. Imports are not separately reported. No estimates of size of the Singapore market are available but it appears to be substantial. One importer indicated imports of 40 containers each 6 months. Thailand reported exports of 5,424 kgs. to Singapore in 1981. Data secured was insufficient to permit a finding of substantial development potential but it may (or probably) exist and further investigation is warranted.

3. Study Commodities with Substantial Market Development Potential

Processed commodities given below were found to have substantial development potential in Singapore for Thai exporters.

The structure of the Singapore market has been described previously. Since importers normally trade in most of the study commodities and serve the different markets, marketing channels for each commodity need not be discussed here. Singapore imposes no tariffs on the commodities and no other considerations affecting imports were identified. There are no established quality standards for the survey commodities and quality specifications were not defined by those interviewed.

Specific purchasers for the commodities are listed at the conclusion of this section.

a. Canned lichees

Market demand. In 1981 Singapore imported 10,204,072 kgs. of canned lichees, an increase of 33% over 1980. It reexported 2,516,014 kgs., 25% of total imports for that year, and a 71% increase over 1980 to other S.E. Asian countries.

Singapore imported 2,341,000 kgs. of fresh lichees in 1981, a decrease of 27% from 1980 imports; 365,000 kgs. of fresh lichees were reexported to S.E. Asian countries.

Total Singapore demand for domestic consumption and reexport of lichees in fresh and processed forms was essentially the same in 1980 and 1981, but significantly more of that demand was satisfied by the processed form in 1981 than in 1980. These figures indicate that there is a substantial growing market in Singapore for canned lichees, a conclusion concurred by those interviewed, and the existence of a substantial market development opportunity for Thai exporters.

Source of supply. Taiwan is the major supplier of both fresh and canned lichees, supplying 90% of the fresh in 1981 and 97% of the canned. It appears that Taiwan is substituting canned lichees for fresh in the Singapore market. China provides the balance; Thailand supplying none.

Providing that Thai exporters are competitive with Taiwan in terms of quality, price and reliability, it appears that Thailand could become a substantial supplier of both fresh and canned lichees to Singapore.

Prices. Those interviewed declined to provide current competitive prices for canned lichees. Average 1981 CIF Singapore prices were S\$2.56/kg., those for shipments from Taiwan were S\$2.56/kg., and from China S\$2.06/kg.

Packaging. The usual can size utilized for consumer sales of fruit, including canned lichees, is 20 oz. or 565 grams, 24 to the case.

Comment. The substantial increased exports of canned lichees by Singapore to S.E. Asian markets indicates that there may be a substantial market development opportunity for Thai exporters in the supply of lichees directly to those markets which should be investigated.

b. Canned longans

Market demand. In 1981, Singapore imported 4,065,421 kgs. of canned longans, an increase of 13% over 1980, and reexported 648,441 kgs. to other S.E. Asian markets. It also imported 1,667,000 kgs. of fresh longans, a 23% decrease from 1980.

Total demand for longans is increasingly being satisfied by canned rather than fresh.

Source of supply. Taiwan supplied 89% of the Singapore canned demand in 1981 for longans, China 9% (a decrease from 16% in 1980), and Thailand a small quantity. Thailand is the principal supplier of fresh longans. Total imports of longans, fresh and canned, are essentially the same for 1980 and 1981; canned longans, supplied by Taiwan, is being substituted for fresh imports, mainly supplied by Thailand.

Thailand is losing its fresh market but there is a substantial market development opportunity in canned longans for Thai exporters, providing they are competitive in price, quality, and reliability with Taiwan suppliers.

Price. Average CIF Singapore price for canned longans from Taiwan in 1981 was S\$2.86/kg. Average FOB Bangkok price for canned longans supplied by Thai exporters to Singapore during the first nine months of 1982 was B29/kg.

Packaging. The usual can size utilized for consumer sales is 20 oz. or 565 grams, 24 to the case.

Comment. The substantial reexport of canned longans by Singapore to other S.E. Asian markets indicates a potential market development opportunity for Thai exporters, in the direct supply of those markets, which should be investigated.

c. Bamboo shoots. Two forms of processed bamboo shoots are imported by Singapore. Since differing market considerations are involved, they are discussed separately.

Dried bamboo shoots

Market demand. In 1981, Singapore imported 111,980 kgs. of dried bamboo shoots, a 25% increase over 1980; 22,464 kgs. were reexported, including 8,600 kgs. to Thailand.

Sources of supply. Thailand supplied 53% in 1981, having supplied none in 1980; China 32% and Taiwan 15%, both down substantially from 1980.

The size of the market demand is relatively small. Thailand was the major supplier in 1981, having apparently bought the market with an extremely low price relative to that of China and Taiwan. There appears to be little market development opportunity for Thai exporters to increase the volume of dried bamboo shoots supplied to the Singapore market.

Prices. Average price, CIF Singapore of Thailand exports in 1981 was S\$1.17/kg., while China's were S\$12.48/kg. and Taiwan's S\$4.01/kg.

The substantial price differential between Thai products and those of China, and to a lesser degree Taiwan, was investigated. Quality of the product was found to be a major consideration. Buyers in Singapore, as well as in the U.S. and other markets, stated that bamboo shoots from China are the best quality bamboo shoots available. Thai bamboo shoots are inadequately dried and processed, resulting in a poor quality product. Thai imports from Singapore are probably the better quality bamboo shoots from China or Taiwan. There is an opportunity for Thai exporters to increase their prices, and returns, by producing a properly dried, better quality product.

Canned bamboo shoots

Market demand. In 1981, Singapore imported 625,958 kgs. of canned bamboo shoots, a 43% increase over 1980, and reexported 263,951 kgs. - 37% to Australia and Sweden.

Sources of supply. Taiwan supplied 54% of canned bamboo shoots in 1981, down from 20% in 1980, and China 46% in 1981, up from 30% in 1980. The foregoing trend tends to confirm the buyer preference for a China quality product, the price of the two countries being essentially the same.

Supply of canned bamboo shoots to Singapore presents a market development opportunity for Thai exporters providing that they can be competitive on price and can match the quality of China's product.

Price. The average 1981 CIF Singapore price for canned bamboo shoots was in the S\$2.37 - 2.41/kg. range. The average FOB Bangkok price received by Thai exporters for small quantities supplied during the first nine months of 1982 was B9/kg.

Packaging

The usual can size for consumer sales is 20 oz. or 565 grams, 24 to the case.

Comment. The supply of canned bamboo shoots to Australia and Sweden directly by Thai exporters, displacing Singapore, appears to offer a market development potential which should be investigated.

d. Canned straw mushrooms

Three varieties of canned mushrooms are imported by Singapore in substantial quantities--straw, button and oyster mushrooms. All are reportedly produced in Thailand to some degree. The worldwide market for canned or dried button and oyster mushrooms is highly competitive with China and Taiwan being major suppliers. There is little market development potential for Thai exporters in these mushroom varieties in Singapore or elsewhere. However, there is substantial potential for the supply of canned straw mushrooms to Singapore.

Market demand. Singapore imported 921,359 kgs. of canned straw mushrooms in 1981, reexporting 139,248 kgs. (a decrease of about 50% from 1980) to other S.E. Asian countries. A likely reason for the decrease is direct supply to those countries by Taiwan or China.

Sources of supply. Taiwan supplied 88% of the canned straw mushrooms Singapore imported in 1981, down 5% from 1980; China 10%, up 4%.

China appears to have attempted to buy the Singapore market with a price about 20% under that of Taiwan with little success. With the lack of demand

for straw mushrooms, relative to other mushroom varieties in most markets, it does not appear that the export of these will be emphasized by China. With competitive pricing and quality, there is development opportunity for Thai exporters in supplying canned straw mushrooms to Singapore.

Price. The average Singapore CIF price of Taiwan canned straw mushrooms imports in 1981 was S\$2.73/kg., that of China was S\$2.22/kg.

Packaging. Usual can sizes for consumer sales is 565, 425 and 400 grams.

e. Cashews.

Market demand. In 1981 Singapore imported 856,561 kgs. of cashews, a 78% increase over 1980. Exports were 695,456 kgs., an increase of 69% over 1980; Malaysian Peninsula 39%, China 18%, U.S. 11%, Lebanon 6%, Hong Kong 5%, Australia 4%, New Zealand 4%. Statistics do not differentiate between shelled or unshelled, raw or roasted, halves or pieces.

There is a growing market for cashews in Singapore for domestic consumption and reexports which offer substantial development potential for Thai suppliers. (Note subsequent comments on prices.)

Sources of supply. Principal sources in 1981 were: India 41%, down from 77% in 1980; China 22%; Brazil 18%, up from 0%; Vietnam 9%, up from 0%; Thailand 2%, up from 0% in 1980.

Prices. There is a substantial price differential in CIF prices received by suppliers. Average 1981 prices were: India S\$15.34/kg.; Brazil S\$15.69/kg.; China S\$11.62/kg; Vietnam S\$1.57/kg.; Thailand S\$4.28/kg.

The reason for the significant differences were investigated. It was determined that most cashews from Thailand were supplied in the shell and not further processed. This leads to the conclusion that Thai suppliers have a significant opportunity to increase their return from cashew sales by application of appropriate processing technology in the shelling and further processing in Thailand. Further processing will also probably be a necessity if Thailand is to increase its share of the cashew markets in Singapore and other markets.

Direct supply of cashews by Thailand to reexport markets of Singapore may also present market development opportunities for Thai suppliers. Based on FOB export prices, the U.S., Australian and New Zealand markets will offer significantly higher returns than other markets.

f. Mango juice. Two processed forms of mango juice are imported, dilute--ready to drink--and concentrated, as well as substantial quantities of fresh mangoes. There is considerable manufacture of the juice in Singapore, from fresh and/or concentrate imports. Estimates of the Singapore demand were not available.

Dilute. In 1981, Singapore imported 106,810 liters, an increase of 24% over 1980, and reexported 155,764 liters. Average CIF price for imports was S\$1.43/liter and for exports the average FOB Singapore prices was S\$1.21, a decline of 68% from 1980, to Southeast Asian and Persian Gulf countries.

Principal suppliers were the Malaysian Peninsula 52% and Taiwan 48%, up from 0% in 1980.

Concentrated. Singapore imported 15,162 liters in 1981, a substantial increase over 1980, and reexported 75,636 liters, up from 40% from 1980. Countries supplying imports were not identified. Average CIF import price was S\$ 1.98/liter; for exports the average FOB price was S\$2.23/liter.

Assessment. There is a development opportunity for Thai exporters to supply dilute juice to Singapore providing that they can be price competitive. The opportunity for supply of concentrated juice is much more limited because of relatively small quantities imported. In addition there appear to be substantial development opportunities for exporters in the supply of juices directly to other S.E. Asian markets currently served by Singapore which should be explored.

Another factor to be considered is the position of Thailand as a supplier of fresh mangoes, a percentage of which is used for the manufacture of juice. Thailand supplied 71% of imports in 1980 but only 23% of a smaller quantity in 1981. Processing mangoes into juice in Thailand will allow Thailand to again become a major supplier of mango products to Singapore.

g. Specific importers identified. The following prospective buyers, all indicating an interest in considering purchase from Thai exporters, were identified and interviewed:

Jardines Marketing Services
Yeo Hiap Seng, Ltd.
S.J. Low Co.

4. Developing the Singapore Market.

The Singapore market differs from other study countries in that it reexports sizable amounts of imported quantities and has a substantial food processing industry supplying both the domestic and export markets. Singapore is the closest to Thailand geographically to the markets investigated.

Because of these characteristics, Singapore offers a number of market development opportunities for Thai exporters; seven have been identified above. In order for Thai processors to take advantage of these opportunities, some adjustments in marketing are needed.

Thai exporter reliability. Singapore importers are more knowledgeable of conditions in Thailand than those of the other countries. They have had commercial trading relations with Thai exporters for many years. The importance of supplier reliability was stressed by all importers. In order to substantially increase exports to Singapore, Thai exporters must be as reliable as their competitors. Shipments must be made when committed and product quality must be maintained in every shipment.

Prices. Singapore importers are somewhat puzzled by the high prices of products from Thailand in comparison to Taiwan, particularly considering that Thailand is closer than Taiwan and labor costs are reportedly less expensive in Thailand. Thai processors are losing sales because of high prices, according to Singapore importers. A reduction in prices to a more competitive level would increase sales to Singapore.

Brands. Singapore consumers are, according to those consulted, highly brand conscious. A new, foreign brand unfamiliar to Singaporeans, would have little opportunity of gaining a substantial share of the market. It is imperative then, for Thai processors to produce products for the Singapore market under private labels of established brands already sold in Singapore. If processors use their own brands, they should be professionally made, designed for the sophisticated Singapore market.

Reexport market. Singapore has established a reexport market in Southeast Asia for commodities it imports from other Asian countries. Commodities reexported in substantial quantities from Singapore are: lichees, longans, canned bamboo shoots, and diluted and concentrated mango juice. Thailand has the opportunity to gain a foothold in some of these markets by exporting processed products directly to those markets currently supplied by Singapore reexports.

F. Hong Kong Market Development Potential

1. Introduction.

In general, the marketing system for the study commodities in Hong Kong is similar to that of Singapore.

a. Sources of processed commodities. There is no significant production of any of the commodities in Hong Kong. They are imported from other countries in fresh or processed form.

b. Marketing channels. Principal markets can be categorized as follows: consumer and institutional markets, ship provisioning and, for processed foods, reexports to other countries. There is little food processing in Hong Kong.

The consumer market is primarily served by a limited number of supermarket chains, at least one affiliated with similar operations in Singapore and other Asian countries. Chains import directly from the suppliers in other countries. Importers/wholesalers supply other retail stores, smaller wholesalers and provision stores. Some larger wholesalers are part of large import-export organizations with offices in Asia, the Pacific and elsewhere. Some importers only handle processed imports while others specialize in fresh produce imports.

c. Principal sources of data and opinions utilized. Important information sources consulted include export-import statistics for 1981 and eight months of 1982; Thai export statistics for 1981 and nine months of 1982; publications provided by the Japanese External Trade Organization and the Thai Commercial Trade Counselor in Hong Kong.

Among the organizations consulted were: Two of the major supermarket chains with over 100 stores, representing a significant share of supermarket sales in Hong Kong; one chain has substantial operations in Singapore and other Asian countries; and six importers/wholesalers of processed commodities, most trading in other Asian and Pacific markets and several fresh produce importers.

d. General comments on the market. Hong Kong is a relatively small market of approximately five million people but has substantial exports of processed commodities. Trading is highly competitive and those involved are reluctant to provide specifics with respect to their product quantity and

other requirements believing that such disclosures would affect their competitive position.

2. Study Commodities with Little Development Potential.

The following study commodities were not found to have substantial development potential in Hong Kong, either because of inadequate data on which to base an assessment, lack of demand, or for competitive reasons.

Processed fruit. All preserved and canned fruits are reported in Hong Kong import statistics in general categories without specific identification of the fruits involved. Quantities imported during the first nine months of 1982 (references to 1982 subsequently refer to this period) were substantial: preserved imports were 9,455,332 kgs. (75% supplied by China, significant quantities by Taiwan, some by Thailand), canned 10,263,406 kgs. (U.S. 35%, China 31%, Philippines 19%, Taiwan 5%, Thailand 7%). While it is likely that there are development opportunities in the supply of some canned fruits, data was insufficient to identify which fruits do have potential and the scope of the opportunities.

Two of the large importers consulted were of the opinion that there is a market development opportunity for Thai exporters in the supply of tropical fruit cocktail, providing there is a red-colored fruit similar to the cherries included in Western fruit cocktails. While unable to estimate demand, they believe it is significant in Hong Kong and in the Pacific areas served by Hong Kong exporters. Further investigation is warranted.

Fresh imports of lichees, papayas, mangoes, and other tropical fruits are also a factor in assessing Thailand's market development strategy in supplying fruits to Hong Kong. In 1982, 5,877,854 kgs. of lichees were imported (70% from China; Taiwan, 26%; Thailand, 4%); 1,503,662 kgs. of papayas (Thailand supplied 80%; balance from Taiwan); 9,469,494 kgs. of mangoes (Philippines, 92%; Taiwan 3%; Thailand, 4%); and 7,353,505 kgs. of unspecified "tropical fruits fresh" were imported (93% from Thailand).

Tropical fruit juices. 1982 fruit juice imports, including both temperate and tropical fruits, were 8,347,684 kgs. Asian sources of supply were the following: Singapore 31%, Taiwan 17%, China 9%, and the Philippines 2%. Pineapple juice imports are included in the above figures. Data is insufficient to determine what quantities of other tropical fruit juices are included in the figures and the scope of market development opportunities which may exist.

Exports of fruit juices from Hong Kong were 2,530,555 kgs. in 1982, 47% to Papua New Guinea. If significant quantities of tropical fruit juices are included in juice exports to New Guinea, supplying it could present a development opportunity for Thai exporters.

Cowpeas, sugar peas. There is only limited demand for these processed commodities in Hong Kong.

Water chestnuts. Market demand for water chestnuts in 1982, based on imports, was: fresh or chilled 3,212, 610 kgs., canned 12, 260, 257 kgs. China supplied 99% of the fresh and chilled, 93% of the canned. With the high quality of the Chinese product and the special relationship which exists between China and Hong Kong, there does not appear to be any significant market development potential for Thai exporters.

Mushrooms. Hong Kong imports and reexports of canned mushrooms are substantial. In 1981, imports were 20,124,189 kgs., 88% from China and 8% from Taiwan, and exports were 6,497,677 kgs., 70% to the U.S. Varieties of mushrooms are not separately reported. With the highly competitive nature of the mushroom industry and the special relationship between China and Hong Kong, it is unlikely that Thai exporters could break into the market in a significant way.

3. Study Commodities with Substantial Development Potential. The structure of the Hong Kong market has been described above. Importers normally trade in a number of the study commodities utilizing those marketing channels. Hong Kong imposes no tariffs on the processed commodities and there were no other significant import considerations found. There are no established quality standards and specifications were not defined by those interviewed.

The following commodities were found to have significant development potential for Thai exporters. Prospective purchasers identified are listed at the conclusion of the section.

a. Baby Corn

Market Demand. In 1981, Hong Kong imported 7,733,668 kgs. of fresh baby corn and 3,530,822 kgs. of canned baby corn.

Source of supply. Taiwan was the principal supplier of both fresh and canned product in 1981. Thailand supplied none.

There is substantial development opportunity for Thai exporters in the supply of both canned and fresh baby corn to Hong Kong, providing they are competitive with Taiwan on price, quality and reliability.

Price. The 1981 average CIF Hong Kong price of imports was HK\$5.06/kg.

Packaging. Several sized cans were observed in supermarkets. The 20 oz. can seemed most prevalent. Fresh packaging consisted of 500 grams of product in Saran-type wrapping.

b. Canned bamboo shoots.

Market Demand. Hong Kong imported 2,866,289 kgs. of canned bamboo shoots in 1981.

Source of supply. Principal supplier was China; Thailand supplied approximately 376,000 kgs. of canned bamboo shoots in 1982, slightly less than 1981.

There is a potential development opportunity for Thailand to increase its share of the market if Thai exporters are competitive with China on price and quality.

Price. The 1981 average CIF Hong Kong import price was HK\$3.70/kg. The current FOB price quoted by Thai exporters is U.S. \$0.54 cents/kg.

Packaging. Bamboo shoot can sizes observed are 359 grams, 552 grams and 800 grams.

c. Asparagus

Market Demand. Hong Kong imported 7,733,688 kgs. of asparagus in 1981. (It is not known what percent of the asparagus was green and white).

Source of supply. Taiwan is the principal supplier. For reasons outlined in the previous section on the U.S. market, supply of processed asparagus to Hong Kong by Thai exporters appears to offer a substantial development opportunity providing they can be competitive with Taiwan on price, quality, and reliability.

Price. The 1981 average CIF Hong Kong import price was HK\$4.43/kg.

Packaging. Canned asparagus, both green and white, seen in supermarkets were in 425-gram cans.

d. Cashews

Market demand. There is a substantial demand in Hong Kong for cashews. During the first eight months of 1982, 5,653,503 kgs. were imported, an increase of 21% over all of 1981. The form of the product imported unshelled or shelled, raw or roasted, halves or pieces, was not separately reported.

Source of supply. Numerous countries supply cashews; the market is highly competitive. In 1982 principal suppliers were: Thailand 30%, Vietnam 15%, China 11%, India 10% and Indonesia 9%.

With the competition between cashew suppliers, there is probably little opportunity for Thai exporters to significantly increase their share of the Hong Kong market. However, as in Singapore, there is an opportunity for them to substantially increase prices they receive for cashews.

Price. There was a substantial differential in average CIF prices received in 1982 between China and India (HK\$27.53/kg. and 33.28/kg. respectively) and Thailand (HK\$4.58/kg.). Investigation showed that cashews imported from Thailand are normally unshelled. With shelling and further processing, it is likely that Thai exporters could increase prices significantly.

e. Specific Importers Identified

The following prospective purchasers, all indicating an interest in considering Thai suppliers were identified:

ETS Ballande Asia Ltd.

Park 'N Shop (Supermarkets) Ltd.

The Dairy Farm (Wellcome Supermarkets) Group of Companies

4. Developing the Hong Kong Market. Thailand is well-established as a supplier of fresh fruits, cashews and pineapple products to Hong Kong. It is not thought of as a major source of other processed fruits and vegetables. Promotional efforts of the Thai Commercial Trade Counselor with respect to fresh produce have been successful and even more sophisticated programs are being implemented.

A promotional program to increase awareness of Thailand as a source of a wide range of processed fruits and vegetables is needed. But promotion of processed fruits should not be pursued at the expense of its position as a major supplier of fresh products. Primary emphasis should continue to be on maintenance and improvement of that position. An objective should be the increase of Thailand's market share of fresh mangoes and lichees. Poor packaging resulting in substantial product losses of fresh papayas was mentioned as an important problem by importers. Thai fruits are often shipped in baskets rather than in cartons which other suppliers use; Thai exporters should ship in internationally accepted cartons.

G. SUMMARY: MARKET DEVELOPMENT OPPORTUNITIES

<u>Commodity and Form of Processing</u> ⁽¹⁾	<u>M A R K E T S</u>			
	<u>U.S.</u>	<u>Japan</u>	<u>Hong Kong</u>	<u>Singapore</u>
<u>Fruits</u>				
. Canned longans				X
. Canned lichees				X
. Canned tropical fruit mix/ cocktail		X		
. Frozen aseptic pack guava, mango, papaya purees	X			
. Dried mangoes, papayas pineapples	X			
. Mango juice				X
. Processed cashews			x(3)	x(3)
<u>Vegetables</u>				
. Canned baby corn	x(2)	X	X	
. Canned straw mushrooms				X
. Canned bamboo shoots	X	X	X	
. Dried bamboo shoots	X	X		x(3)
. Canned water chestnuts	X			
. Canned asparagus (white, green)	X		X	

(1)References to canned, also includes bottled.

(2)Providing that Thailand also supplies canned water chestnuts and bamboo shoots.

(3)These commodities indicate there is a potential for increasing prices received by Thai exporters but not necessary increased volumes.

There are opportunities for Thai exporters to increase their returns for certain commodities through improvement in product quality and thus, better prices. Thai prices for cashew exports to Singapore and Hong Kong, and dried bamboo shoot exports to Singapore, are examples.

Other potential market development opportunities were identified during the course of the study which warrant further investigation. Some involve fresh commodities or markets other than those being investigated.

These opportunities are:

- a) Baby corn
 - . Fresh to Hong Kong
 - . Canned to Singapore
- b) Lichees
 - . Fresh to Singapore
- c) Longans
 - . Canned directly to Southeastern Asian markets currently reexported by Singapore
- d) Bamboo shoots
 - . Canned to Australia and Sweden
- e) Asparagus
 - . Fresh to Hong Kong, U.S. and Europe
 - . Canned to Europe
- f) Tropical fruit juices/nectars
 - . Canned/bottled directly to Hong Kong, currently supplied by Singapore
 - . Canned/bottled to Papua New Guinea, currently supplied by Hong Kong

The processed promotional program should emphasize those commodities identified here as having substantial development potential and tropical fruit cocktail and juices if warranted by further investigation. Such a program will not be effective unless Thai exporters establish and maintain an aggressive marketing program. All importers stressed a supplier reliability factor in the establishment and continuation of trading relationships with Thai firms. Shipments must be made on time, product quality must be maintained. Pricing must be competitive.

IV. RECOMMENDATIONS FOR INTEGRATED MARKET DEVELOPMENT PROGRAM

Processed study commodities found to have substantial development potential in the U.S., Japan, Singapore and Hong Kong have been summarized in Section G. Other markets for the commodities in fresh form appearing to have significant enough potential to warrant further investigation are also identified.

The focus of this study was on market development potential of the study commodities and market requirements which Thai processors/exporters will have to satisfy in order to capitalize on the opportunities. Of equal importance for success of the integrated program will be in-depth investigations of the processing and available crops for processing to supply the export marketing system.

Marketing considerations of particular importance in each country have been mentioned previously in the country analysis sections. Recommendations with respect to the more general aspects of the Thailand export development program are presented here. Processors/exporters will necessarily be involved in all aspects of the program. Most appropriate areas for involvement of the RTG and AID are suggested but this should not be taken to mean that these cannot, or should not, become involved in other areas found to be appropriate.

A. Processors/Exporters

Market promotion. Most prospective buyers interviewed in the study are not familiar with the range of processed commodities available from Thailand. Professionally prepared catalogs of processor capabilities and products available should be compiled as an effective method for distribution to prospective purchasers. One avenue of distribution would be Thai commercial trade offices in Bangkok and abroad. Processors/exporters should also have professionally prepared promotional materials describing their capabilities and product lines available for prospective buyers. Exporters need to develop a routine practice of prompt response to inquiries from prospective purchasers, supplying price lists and samples when requested, and continuing follow-up with prospective buyers. Buyers usually have a number of sources available and will turn to others if an exporter does not demonstrate his interest by responding quickly.

It is recommended that an annual, processed food trade fair be held in Bangkok each year. This will be a particularly effective way to bring Thai exporters and Asian buyers together. Distances are not too great and buyers are accustomed to attend such fairs for the purpose of arranging commercial transactions. In addition, trade fairs will provide good opportunities for Thai processors to determine at nominal costs - buyer requirements, new potential markets, new products that buyers are seeking and new developments in other important areas.

Establishment of a reputation as reliable suppliers will be an important factor for successful marketing. Exporters should make every effort to assure on-time delivery of the quantity and quality of products ordered on a routine basis.

Product Quality. Establishment and maintenance of the product quality demanded by the market is so important it cannot be stressed enough. Without this, new markets will not be developed, existing market share will not increase and may even be reduced. Quality standards and specifications will usually be provided by prospective buyers. It is also recommended that competitive products - those identified by the supplier as being what he wants or those having the largest share of the market - be collected, examined and duplicated to ensure market acceptance.

Processors will need to establish adequate processing and inspection procedures to assure maintenance of product quality.

The reputation of Thai processors, generally, for product quality can materially affect the market opportunities for individual firms. It is recommended that a government organization or association of food processors define internationally acceptable standards for export commodities and that it have an effective enforcement mechanism, approved by its members, to ensure maintenance of those standards.

Processing Capacity and Capabilities. Reported processing capacity for products identified as having development potential in this survey is low in terms of the size of the market potential. Only pineapple processing capacity is adequate.

With respect to commodities to be emphasized in the export development program, an in-depth investigation of the capacities and capabilities of interested Thai processors is required. The purpose of this is to determine

the increase in capacity needed and the new technology or processor assistance that may be required.

Packaging. Packaging quality, and adequacy to protect processed products during transport, will be a significant factor in success of an expanded export program. Importers in the U.S. and Asian markets report that the quality of Thai cartons and cans are sometimes sub-standard, a major consideration for buyers. According to Japanese importers, products can arrive from Thailand with up to 10% damage. The average for damaged products from other countries is about 2%.

Thai processors must package according to internationally accepted standards for cartons, cans, bottles, etc. The Thai pineapple processing industry does adhere to international standards, some processors of other commodities do not. It is recommended that an in-depth investigation of processed commodity containers and packaging be pursued. The scope of work would include current packaging material availability and costs and consideration of alternatives such as expanding aseptic packaging for development of a packaging improvement program.

Labels. While labels might appropriately be considered "packaging" it is separately mentioned here for emphasis. The importance of label design and quality, particularly on products for the consumer market, was mentioned by many importers. High quality of Taiwan labels was given as an important factor in continuing purchases from Taiwan rather than other sources. Comparable quality will be required of Thai exporters.

Professionally designed, well-printed labels, appropriate for the market involved, will be essential. The design must be attractive to buyers in that particular market as it is the only way for purchasers to know what is in the can. For example, Thai language characters on a label are not appropriate for the U.S. and other Asian markets. And labels for the U.S. market must comply with governmental labeling regulations.

Private-labeling by processors, using labels designed and owned by the buyer, will be required for many commodities. The practice, at least by U.S. buyers, is to provide a processor with a copy of the label which can then be duplicated. Printing quality must satisfy buyers. Taiwan maintains a "label bank" for private labels previously used by Taiwan processors and new ones are added as new buyers are added.

It is recommended that a "label bank" be established by Thai processors, backed up by good quality printing arrangements, as an important feature of the export development program.

Cost Reduction. Thai exporters must be price-competitive to break into, or maintain a position in, a market. Their ability to do so is in turn dependent upon their costs of production, processing and marketing. Importers indicated that Thai price quotations for commodities included in this survey more often than not are uncompetitively high.

Processors should analyze their costs more closely, identify these which can be eliminated or reduced and establish continuing controls to maintain competitive costs. Expert assistance might prove to be useful for some of the firms.

B. Royal Thai Government (RTG)

Assistance to Thai processors/exporters in the following areas:

- . Organization of annual food processors' trade fair in Bangkok
- . Production and distribution of Thailand product catalogs to prospective buyers in Thailand and overseas
- . Establishment of a new food processors' association or the strengthening of the existing one to serve as an effective vehicle for Thai processors. The association would perform the following functions: Industry-wide marketing promotional work, establish and maintain product quality standards, provide a mechanism for resolution of buyer-exporter controversies and other appropriate purposes for increasing the exports of Thai food products.

Investigation of processing capacities and capabilities. As mentioned above, an in-depth investigation of processing capacities, capabilities and needs is required for the program. This should be conducted by the appropriate RTG agency with the cooperation of the processors.

Packaging. The RTG should include this investigation as an integral part of the development and pursue it with direct involvement of processors.

Crop production for processing. An in-depth investigation of production, transport to processing plants and costs of crops for processing into commodities to be marketed is required prior to any promotion of the marketing

of the commodities. Processors must be assured of a reliable and adequate supply of appropriate, quality raw materials before export markets can be supplied. The need for investigation of this important element of the export marketing system was recognized at the time of the commencement of this study but was not included in the scope of work. If the investigation finds that an adequate supply of a particular crop is not currently available for processors, a program for development of sufficient supplies must be addressed or export market development of the processed commodity should not be pursued. The investigation should be assisted by the RTG with the necessary involvement of processors.

Taxes and governmental regulations. Thai processors will have to be competitive with suppliers from other countries. Taxes, governmental regulations, and efficiency of export procedures and adequacy of export facilities are all significant factors affecting competitiveness. Removal of taxes, appropriate modifications of regulations, streamlining of export procedures and improvement in export facilities and their operations can make a substantial contribution of making Thai exporters more competitive.

Information collection. Two categories of information will be of considerable importance to Thai exporters: commodity export pricing of principal competitor countries such as China and Taiwan on a continuing and current basis and export food processing trends in these countries. It is recommended that a system for the collection and dissemination of pricing information to Thai exporters from these countries on a current and timely basis be established. Thai commercial trade offices in these countries could perform the information collection function.

C. AID

Assistance to RTG. Primary role of AID will be in furnishing expert help, technical assistance and technology required. This assistance would be in the following fields: product quality standards and maintenance of quality; investigation of processor capabilities and needs; packaging, processing cost reduction programs, adequate crop production for processing; survey of taxes and governmental regulations affecting competitiveness of Thai exporters and design of the pricing and trend information system. In the event it is determined that processor facility expansion or improvement of export facilities is needed, AID might consider assistance for these purposes.

Other markets for commodities to be promoted. This study only considered development potential in four countries. During the course of the study, other market areas which appear to offer development potential for the commodities were identified but not investigated. As a supplement to this survey, it is recommended that those market areas identified with potential should also be investigated. It may be found that requirements for other markets may be less demanding, and easier for Thai exporters to satisfy, than the markets investigated in this survey.

Export marketing of fresh fruits and vegetables. In an export marketing program for processed fruits and vegetables, fresh and processed products should be considered. The two are integrally related at the production level and some Asian countries' success in increasing processed exports may be at the expense of a reduction in imports of fresh commodities currently supplied by Thailand. It is then recommended that a market investigation be pursued with respect to fresh commodity exports to Asian markets.

D. Agro-Industry Investments. This report has mentioned a number of problems concerning the fruit and vegetable processing and exporting industry in Thailand. Also alluded to several times was the prominent international position of the Thai pineapple industry compared to other fruits and vegetables processing.

The pineapple industry has had extensive, outside investments, along with the latest available technology from production to export of finished product. Encouragement of joint ventures by agro-industrial firms in other areas of the fruit and vegetable industry could bring to Thailand a similar success story in some commodities. A recent report sponsored by the Bureau of Private Enterprise of AID (Thailand: Assessment of Agro-Industry Investment Opportunities, PIP/AFSI, Don Leeper, 1982 - PIP/Thailand/Apr 82/No. 10) details some opportunities in the fruit and vegetable processing industry in Thailand.

Outside investments and expertise by the private sector could be a function of the RTG and food processing industry along with the assistance of AID's Bureau of Private Enterprise. A successful program to encourage investments by international food processing firms with necessary expertise and financial backing would reduce the need for government assistance. This important aspect in a program to increase exports of processed fruits and vegetables from Thailand should be explored in detail by the three parties addressed in these recommendations in order to greatly speed up Thailand's increased prominence in the international processed foods industry.

V. APPENDICES

APPENDIX A FDA FOOD CANNING ESTABLISHMENT & PROCESS FILING FOR STILL RETORT PROCESSES

Form Approved
OMB No. 57-0083

FOOD CANNING ESTABLISHMENT AND PROCESS FILING FOR STILL RETORT PROCESSES <i>(Please type or print all information requested. If item does not apply enter "NA".)</i>										THIS IS AN				FDA USE ONLY								
										<input type="checkbox"/> ORIGINAL SUBMISSION <input type="checkbox"/> AMENDED SUBMISSION				FCE NO.								
000	A	ESTABLISHMENT NAME					FDA USE ONLY			000	D	PARENT COMPANY NAME					PARENT COMPANY AF NO.					
000	J	ADDRESS (No. and street)										000	F	ADDRESS (No. and street)					DATE RECEIVED BY FDA			
000	C	CITY			STATE	ZIP CODE		COUNTRY			000	F	CITY			STATE	ZIP CODE		COUNTRY			
FDA USE ONLY	A	FOOD PRODUCT NAME AND FORM																				
B	I	NAME OF STERILIZER				PROCESS ORIGIN				CONTAINER TYPE (Check one)				OTHER CRITICAL CONTROL FACTORS (Check all that apply) 60 <input type="checkbox"/> CONTAINER POSITION IN RETORT 71 <input type="checkbox"/> OTHER (Specify) 61 <input type="checkbox"/> PERCENT SOLIDS 62 <input type="checkbox"/> RATIO OF SOLIDS TO LIQUIDS 63 <input type="checkbox"/> SYRUP STRENGTH 64 <input type="checkbox"/> ARRANGEMENT OF PIECES IN CONTAINER 65 <input type="checkbox"/> DROWING CONDITIONS 66 <input type="checkbox"/> TENDENCY TO MAT 67 <input type="checkbox"/> METHOD OF PREP 68 <input type="checkbox"/> MATURITY 69 <input type="checkbox"/> FORMULA CHANGES 70 <input type="checkbox"/>								
		SOURCE				MONTH AND YEAR				1 <input type="checkbox"/> TINPLATE OR STEEL CAN 4 <input type="checkbox"/> OTHER (Specify) 2 <input type="checkbox"/> ALUMINUM CAN 3 <input type="checkbox"/> GLASS												
C	D.	MAXIMUM WATER ACTIVITY ¹		pH		MAXIMUM CONSISTENCY OR VISCOSITY IN CENTIPOISES OR APPROPRIATE UNITS ³				MIN CONTAINER VACUUM AT CLOSING MACHINE (Inches of Hg @ 77 ± 2°F)		81 <input type="checkbox"/> PERCENT SOLIDS 66 <input type="checkbox"/> TENDENCY TO MAT 82 <input type="checkbox"/> RATIO OF SOLIDS TO LIQUIDS 67 <input type="checkbox"/> METHOD OF PREP 63 <input type="checkbox"/> SYRUP STRENGTH 68 <input type="checkbox"/> MATURITY 64 <input type="checkbox"/> ARRANGEMENT OF PIECES IN CONTAINER 69 <input type="checkbox"/> FORMULA CHANGES 65 <input type="checkbox"/> DROWING CONDITIONS 70 <input type="checkbox"/>										
		NORMAL	MAX-IMUM ²	VALUE AT 77 ± 2°F	VALUE AT OTHER TEMP	OTHER TEMP (°F)	UNITS	METHOD NAME														
		CONTAINER DIMENSIONS			MINIMUM INITIAL TEMP (°F)			SCHEDULED PROCESS				MAXIMUM DRAINED WEIGHT (oz) ⁴		MINIMUM NET WEIGHT (oz) ⁵								
		DIAM	HGT					TIME (min)	TEMP (°F)	LEAST STERILIZING VALUE (F ₀) OF THE SCHEDULED PROCESS ⁵												
		LGT	W	HGT																		
D	01																					
D	02																					
D	03																					
D	04																					
D	05																					
D	06																					
D	07																					
D	08																					
AUTHORIZED COMPANY REPRESENTATIVE																						
000	S	NAME					TITLE					SIGNATURE				DATE						

¹If reduced water activity is used as an adjunct to the process, specify the maximum water activity.
²Where acidification is followed for normally low-acid fruits, vegetables or vegetable products for the purpose of thermal processing, specify the maximum finished product equilibrium pH.

³If a critical factor in the process.
⁴For vacuum processes only.
⁵Or equivalent scientific basis for process adequacy.

100

APPENDIX B

Typical Specifications for the U.S. Market: Guava, Papaya, Mango Purees for Nectars

Guava Puree Specifications

Description

Guava Puree is manufactured from mature, sound guavas, passed through a finisher with a .020 inch screen. Variety preferred is pink Hawaiian type. (Yellow or white is acceptable, providing it meets all other specifications.) The puree is packed in either No. 10 cans or 5 gallon cans, or frozen in drums or boxes.

Standards

Brix:	8.0 to 10.0 (8.0 minimum)
Acid:	0.4 to 0.9
pH:	Under 4.5
Standard Plate Count:	Is less than 50,000/g if frozen.
Salmonella:	Negative
Mold Count:	Less than 10% by Howard Mold Count Method
Color:	Pinkish. Or if it is the white variety, it should be white; the yellow variety should be a pale yellow.
Defects:	Practically free of defects
Flavor:	Good guava flavor; free from off-taste and odor.

Papaya Puree Specifications

Description

Papaya puree is manufactured from mature, sound papayas. It is passed through a finisher with a 0.020 inch screen. Ascorbic, citric or malic acid may be added to lower the pH to under 4.5. The product is packaged and frozen in a clean container.

Standards

Brix:	14.0 ⁰ (Minimum 12.0 ⁰)
Moisture:	85.3
Ash:	0.68%
Fat:	0.162%
Protein:	0.657%

(Papaya Puree Standards continued)

Carbohydrates:	13.5%
Calories/100 g:	50
pH:	Under 4.5 (prefer 4.1 to 4.2)
Std. Plate Count:	50,000/g maximum (frozen)
Salmonella:	Negative
Mold Count:	Less than 10% by Howard Mold Count
Color:	Golden yellow, no carmelization
Defects:	Practically free from defects
Flavor:	Good papaya flavor, free from off-flavor and taste.

Mango Puree Specifications

Description

Mango puree is manufactured from mature, sound mangoes; seed and skin are removed, pulp is passed through a .033 inch screen. It is packed in either No. 10 cans or 5 gallon cans, or frozen in boxes or drums.

Standards

Brix:	15 to 18
pH:	4.0 to 4.5
Color:	Bright yellowish-orange
Flavor:	Good; free from off-taste and odor
Defects:	Practically free of defects
Standard Plate count:	50,000/g maximum (frozen)
Salmonella:	Negative
Mold Count:	Less than 10% by Howard Mold Count

APPENDIX C

**U.S. Standards for Canned Asparagus
White and All-Green**

§ 155.200 CERTAIN OTHER CANNED VEGETABLES*

Promulgated February 27, 1940, as amended. Revised effective June 17, 1974

IDENTITY

(a) The canned vegetables for which definitions and standards of identity are prescribed by this section are those named in column I of the table set forth in paragraph (b) of this section. The vegetable ingredient in each such canned vegetable is obtained by proper preparation from the succulent vegetable prescribed in column II of such table.

If two or more forms of such ingredient are designated in column III of such table, the vegetable in each such form is an optional ingredient. To the vegetable ingredient additional ingredients as required or permitted by paragraph (c) of this section are added, and the food is sealed in a container and so processed by heat as to prevent spoilage.

(b) The table referred to in paragraph (a) of this section is as follows:

I Name or synonym of canned vegetable	II Source	III Optional forms of vegetable ingredient
Artichokes.....	Flower buds of the artichoke plant.....	Whole; half or halves or halved, whole hearts; halved hearts; quartered hearts
Asparagus.....	Edible portions of sprouts of the asparagus plant, as follows: 3 3/4 inch or more of upper end..... 3 3/4 inch or more of peeled upper end..... Not less than 2 3/4 inch but less than 3 3/4 inch of upper end..... Less than 2 3/4 inch of upper end..... Sprouts cut in pieces..... Sprouts from which the tip has been removed, cut in pieces.	Stalks or spears Peeled stalks or peeled spears. Tips. Points. Cut stalks or cut spears. Bottom cuts or cuts—tips removed

**UNITED STATES STANDARDS FOR GRADES OF
CANNED ASPARAGUS**

(Effective June 20, 1973)

§2852.2541 IDENTITY

"CANNED ASPARAGUS" means the canned product prepared from clean sound, succulent shoots of the asparagus plant prepared and processed in accordance with good commercial practice as such product is defined in the Food and Drug standard of identity (21 CFR 155.200) (this Almanac).

is recommended in cut spears over 1 1/4 inches long and 15 percent in cut spears 1 1/4 inches or less in length. (Table 1)

(e) "Bottom Cuts" or "Cuts-Tips Removed" consists of portions of shoots with heads removed that are cut transversely into pieces.

(f) "Mixed" consists of two or more of the foregoing styles.

§2852.2542 STYLES

(a) "Spears" (stalks), which may be peeled or unpeeled consists of the head and adjoining portion of the shoot 3 3/4 inches or more in length.

(b) "Tips" consist of the head and adjoining portion of the shoot less than 3 3/4 inches but not less than 2 3/4 inches in length.

(c) "Points" consists of the head and adjoining portion of the shoot less than 2 3/4 inches in length.

(d) "Cut Spears" (cut stalks) consist of shoots cut transversely into pieces. A minimum of 20 percent, by count, of heads

§2852.2543 GRADES

U. S. GRADE A or U. S. FANCY canned asparagus possesses a good flavor; a clear liquor; a good color; a good character; is practically free from defects; and scores not less than 85 points; provided, that the liquor may be fairly clear and color fairly good if the total score is not less than 85 points.

U. S. GRADE C or U. S. STANDARD canned asparagus possesses a fairly good flavor; a fairly clear liquor; a fairly good color; a fairly good character; is fairly free from defects; and scores not less than 70 points.

SUBSTANDARD canned asparagus fails to meet the requirements of U. S. GRADE C or U. S. STANDARD.

§2852.2544 TYPES

(a) "Green" (all green)—Units are typical green, light green, or yellowish green in color.

(b) "Green Tipped"—spears, tips and points, of which one-half or more of the unit, measured from the tip end, is green, light green or yellowish green.

(c) "Green tipped and white"—(1) spears, tips and points which are typical white or yellowish white, and may have green, light green or yellowish green heads, and the green color may extend to not more than one-half the length of the stalk, measured from the tip end (2) green tipped and white spears, tips and points, when cut into units may consist of a mixture of typical white, yellowish white, green, light green, or yellowish green units.

(d) "White"—Typical white or yellowish white.

§2852.2545 RECOMMENDED FILL OF CONTAINER — See "General Requirements," introduction to this section.

§2852.2546 RECOMMENDED MINIMUM DRAINED WEIGHTS— (a) not a factor of quality for the purposes of these grades.

(b) *Method for ascertaining drained weight*—"See General Requirements," introduction to this section.

Compliance with recommended minimum drained weights—A lot meets the minimum drained weight recommendations if:

(1) The average of the drained weight of all the sample units in the sample meets the recommended minimum average drained weight (designated as X_d in table II); and

(2) The number of sample units which fail to meet the recommended drained weight lower limit for individuals (designated as LL in table II) does not exceed the applicable acceptance number specified in table III.

TABLE II.—RECOMMENDED MINIMUM DRAINED WEIGHT FOR CANNED ASPARAGUS

Container designation (metal, unless otherwise stated)	Container dimensions (inches; or water capacity in ounces avoirdupois as applicable)		Small, medium, or large large sizes; and blends of these sizes				Extra large, colossal, giant sizes; or blends including these sizes				Cuts spear, bottom cuts-tips removed			
	Diameter	Height	Green tipped and white; white (ounces)		Green and green tipped (ounces)		Green tipped and white; white (ounces)		Green and green tipped (ounces)		Green tipped and white (ounces)		Green (ounces)	
			LL	X _a	LL	X _a	LL	X _a	LL	X _a	LL	X _a	LL	X _a
8 oz glass.....	8.5 oz avdp.....		4.8	5.1	4.6	4.9	4.8	5.1	4.6	4.9	4.7	5.0	4.4	4.7
8Z short.....	2 1/4".....	3	4.4	4.7	4.2	4.5	4.4	4.7	4.2	4.5	4.2	4.5	4.1	4.3
8Z tall.....	2 1/4".....	3 1/2	4.9	5.2	4.7	5.0	4.9	5.2	4.7	5.0	4.7	5.0	4.5	4.8
No. 1 picnic.....	2 1/4".....	4	6.6	7.0	5.8	6.2	6.1	6.5	5.6	6.0	6.2	6.5	5.7	6.0
12Z.....	2 1/4".....	4 1/2	7.6	8.0	7.1	7.5	7.3	7.7	6.8	7.2	7.3	7.7	6.8	7.2
13 1/2Z glass.....	14.0 oz avdp.....		8.6	9.1	7.8	8.3	8.1	8.6	7.6	8.0				
No. 301.....	3.....	4 1/2	9.0	9.5	8.2	8.7	8.5	9.0	7.9	8.4	8.6	9.0	8.2	8.6
300 x 409.....	3.....	4 1/2	9.2	9.7	8.5	9.0	8.7	9.2	8.1	8.6	8.8	9.2	8.4	8.8
No. 1 tall.....	3 1/2".....	4 1/2	9.9	10.5	8.8	9.4	9.3	9.9	8.5	9.1	9.1	9.6	8.6	9.1
No. 303 glass.....	17.7 oz avdp.....		10.3	10.9	9.1	9.7	9.7	10.3	8.8	9.4	9.4	9.9	8.9	9.4
No. 303.....	3 1/2".....	4 1/2	10.1	10.7	8.9	9.5	9.5	10.1	8.6	9.2	9.2	9.7	8.7	9.2
No. 303 cylinder.....	3.....	5 1/2			10.3	11.0			9.8	10.6				
No. 2.....	3 1/2".....	4 1/2	12.3	13.0	11.1	11.8	11.6	12.3	10.6	11.3	12.1	12.7	11.1	11.7
No. 2 1/2 glass.....	29.5 oz avdp.....		17.7	18.7	16.0	17.0	16.7	17.7	15.5	16.5	17.6	18.3	16.0	16.7
No. 2 1/2.....	4 1/2".....	4 1/2	18.0	19.0	16.2	17.2	17.0	18.0	15.7	16.7	17.8	18.5	16.2	16.9
No. 5 squat.....	6 1/2".....	4 1/2	41.5	43.0	37.5	39.0	39.5	41.0	37.5	39.0	41.0	42.0	37.0	38.0
No. 10.....	6 1/2".....	7							63.1	64.5	63.8	65.2		

X_a means the average drained weight of all the sample units in the sample. LL means lower limit for drained weights of individual sample units.

TABLE III.—SINGLE SAMPLING PLAN FOR DRAINED WEIGHTS

Sample size (number of sample units).	Acceptance No.....								
	3	6	13	21	29	38	48	60	73
Acceptance No.....	0	1	2	3	4	5	6	7	8

§2852.2548 SIZE DIAMETER OF SPEARS, TIPS AND POINTS

Determined by measuring the largest diameter across the base at right angles to the longitudinal axis of the unit. Spears longer than 5 inches are measured at a point 5 inches from the top of the spear. Units 5 inches and less are measured at the base or largest cut end of the unit.

ured at the base or largest cut end of the unit.

§2852.2549 COMPLIANCE WITH SINGLE SIZE RECOMMENDATIONS

Spears, tips and points meet a designated size when not more than 20% by count are of the next size smaller or next size larger than the diameter range of the particular size designation.

DIAMETER SIZE DESIGNATIONS:

Small—approximately 6/16"; Medium—6/16 to 8/16"; Large—8/16 to 10/16"; Extra Large or Mammoth—10/16 to 13/16"; Colossal—13/16 to 16/16"; Giant 16/16" and over; Blend of Sizes—a mixture of two or more of the foregoing sizes.

SCORE CHART FOR CANNED ASPARAGUS

FACTORS	POINTS		GRADE A	GRADE C	Substandard
	Maximum		Fancy	Standard	
Liquor.....	10		9-10	8-7	0-6*
Color.....	20		17-20	14-16	0-13*
Defects.....	30		25-30	21-24*	0-20*
Character.....	40		34-40	28-33*	0-27*
Minimum Score.....			85	70

* Limiting rule: Asparagus falling in this classification cannot earn higher grade regardless of total score.

NOT SCORED—FLAVOR—"Good Flavor" (A) has a good, characteristic flavor and odor and is free from objectionable flavors and odors. "Fairly good Flavor" (C) may be lacking in good flavor and odor but is free from objectionable flavors and odors.

SCORING FACTORS

LIQUOR—(A) "clear liquor" may possess a typical yellow or green color and is fairly free from suspended material and sediment. (C) "fairly clear liquor" may be cloudy but not excessively cloudy or may possess an accumulation of sediment which may be slightly gray or slightly brown but not seriously objectionable and not off color.

COLOR—(1) **SPEARS, TIPS AND POINTS** (i) **Green**: Units possess (A) good (C) fairly good, characteristic green, light green or yellowish green color typical of (A) well developed (C) fairly well developed asparagus, and the bottom portion of not more than (A) 10% (C) 20% by count, or (A) 1 Unit, which ever is larger, may possess typical white or yellowish white color not to exceed (A) 1/8 (C) 1/4 of the length of the unit.

(ii) **Green Tipped**—Units possess (A) good (C) fairly good characteristic green, light green, or yellowish green color with typical white or yellowish white color at the base ends, typical of (A) well developed (C) fairly well developed asparagus; and not more than (A) 20% (C) 50% by count, may possess typical white or yellowish white color in excess of one-half of the length of the unit, or may be all green.

(iii) **Green Tipped and White**—Units possess (A) good (C) fairly good, characteristic white or yellowish white color, and may possess green, light green, or yellowish green heads and adjacent areas typical of (A) well developed (C) fairly well developed asparagus; and not more than (A) 20% (C) 50% by count, may possess green, light green, or yellowish green heads and adjacent areas exceeding 1/2 of the length.

(iv) **White**—Units may possess (A) good (C) fairly good, characteristic white or yellowish white color typical of (A) well developed (C) fairly well developed asparagus; and not more than (A) 10% (C) 20% by count, or (A) 1 unit, which ever is larger, may possess green, light green, or yellowish green heads and adjacent areas not to exceed 1/2 of the length.

(2) **CUT SPEARS, BOTTOM CUTS, OR CUTS-TIP REMOVED AND MIXED**—(i) **Green**—Units possess (A) good (C) fairly good, characteristic green, light green, or yellowish green color typical of (A) well developed (C) fairly well developed asparagus; and not more than (A) 10% (C) 20%, by count may be green and white or white; provided not more than (A) 2% (C) 5% may be white.

(ii) **Green Tipped and White or White**—Units possess (A) good (C) fairly good, characteristic color, typical of (A) well developed (C) fairly well developed green tipped and white or white asparagus.

DEFECTS—Refers to the degree of freedom from silt, loose material, shattered heads, misshapen units, poorly cut units, damaged units, and seriously damaged units. **Definition**—**"Loose Material"** means shattered asparagus material and cut or broken pieces less than 3/8 inches in length. **"Shattered Head"** means broken or shattered to the extent that appearance is seriously affected. **"Misshapen"** means a spear, tip or point badly crooked or any unit seriously affected by doubles or other malformations. **"Poorly Cut"** unit has a very ragged, stringy or frayed edge or edges; or is partially cut or cut at an angle less than approximately 45 degrees. **"Damaged"** includes discoloration, mechanical injury or other means materially affecting appearance or edibility. **"Seriously Damaged"** means appearance or edibility seriously affected.

TOLERANCES—(A) none (C) not more than a trace of grit or silt may be present that affects appearance or edibility; loose material may be present that does not (A) materially (C) seriously affect appearance.

Spears, Tips and Points—"Green and Green Tipped"—Not more than (A) 10% (C) 20%; and "Green Tipped and White" and "White" not more than (A) 15% (C) 30% by count have shattered heads, misshapen, poorly cut, damaged and seriously damaged units, provided, that not more than (A) 3% (C) 10% may be seriously damaged; or one unit in a single container may be seriously damaged if such unit exceeds the allowance of (A) 3% (C) 10%; provided that in all of the containers comprising the sample such damaged units do not exceed an average of (A) 3% (C) 10% of the total number of units.

Cut Spears, Bottom Cuts, or Cut-tips removed, and Mixed—For the applicable style, not more than (A) 10% (C) 20% by count have shattered heads, are misshapen, poorly cut, damaged and seriously damaged; provided not more than (A) 2% (C) 7% may be seriously damaged; provided that in all of the containers comprising the sample, or one unit in a single container, if larger, such damaged units do not exceed an average of (A) 2% by count, of the total number of units.

CHARACTER—Refers to the degree of development of the head and bracts and to the tenderness and texture. **"Well developed"** means that head appearance is not materially seedy and is practically compact. **"Fairly Well Developed"** means that the head may show a seedy appearance over the surface and the head and bracts may be elongated but not so developed or elongated as to give definitely spread or branching appearance.

HEAD DEVELOPMENT—(A) **Spears, Tips and Points** not less than 85% **Cut Spears and Mixed** not less than 50%, are well developed and the remainder at least fairly well developed. (C) applicable styles not less than 90% at least fairly well developed.

TOUGH UNITS—Maximum tolerance: **Spears, Tips and Points**—"Green" and "Green Tipped" (A) 10% (C) 25%; "Green Tipped and White" and "White" (A) 20% (C) 50%. In (A), one unit may be tough if it exceeds the percentage. **Cut Spears and Mixed**—"Green" and "Green Tipped" (A) 10% (C) 25%; "Green Tipped and White" and "White" (A) 20% (C) 50%. **Bottom Cuts or Cuts—Tips Removed**—"Green" and "Green Tipped" types, not more than (A) 10% (C) 25%; "Green Tipped and White" and "White," not more than (A) 33 1/3% (C) 50%.

TOUGHNESS DEFINED—A tough Spear, Tip or Point is not cut through in 5 seconds or less when tested by the fibrometer, and possess fibrous material which is materially objectionable upon eating. The fibrometer test is made at a point 1 inch from the cut end on the green type, 1 1/2 inches from the cut end on the green tipped type and at mid-point of the green tipped and white and white types.

In all other styles, a tough unit is one possessing fibrous material which is materially objectionable upon eating.

The cutting wire of the fibrometer shall be 0.031 inch diameter stainless steel wire, is mounted in a metal frame having an overall weight of three pounds avoirdupois. The slots in the block supporting the asparagus unit to be tested shall be not less than 0.039 inch or more than 0.042 inch in width.

APPENDIX D Domestic Output, Imports, Exports, and Domestic Distributing Volume of Vegetables and Vegetable Products (JAPAN)

(Fresh Vegetable)

(Unit: tons)

Category \ Year	1973	1974	1975	1976	1977	1978
Domestic Output	14,806,000	14,628,000	14,645,000	14,727,000	15,529,000	15,482,000
Imports	57,385	76,237	43,320	91,746	55,999	112,977
Exports	2,498	1,398	6,522	3,682	3,152	2,374
Domestic Distributing Volume	14,860,887	14,702,839	14,681,798	14,815,064	15,581,847	15,592,603

Note: 1) Domestic Distributing Volume = Domestic Output + Imports - Exports
2) Imports include "Other Fresh Fruits"

Source: • Domestic Output - "Shipment Statistics of Vegetable Output"
• Exports and Imports - "Monthly Report of Japanese Foreign Trade"

(Pickled Vegetable)

(Unit: tons)

Category \ Year	1973	1974	1975	1976	1977	1978
Domestic Output	826,897	830,467	841,373	871,409	880,799	931,230
Imports	(46,677)	(49,104)	(64,397)	(68,669)	(71,277)	(92,555)
Exports	620	636	718	696	813	875
Domestic Distributing Volume	826,277	829,831	840,655	870,713	879,986	930,355

Note: 1) As no information is available on imports of pickled goods, imports indicate imports of salt-preserved goods.
2) Domestic Distributing Volume = Domestic Output - Exports

Source: • Domestic Output - "Statistical Survey of Food Industry", issued by Food Marketing Research and Information Center
• Exports and Imports - "Monthly Report of Japanese Foreign Trade"

Remarks: Import Items - Small Eggplants, Bracken, Scallions, Others (salt preserved), Gingers (salt preserved)
Export Items - Scallions, Pickled Radish, Others

(Frozen Vegetable)

(Unit: tons)

Category \ Year	1973	1974	1975	1976	1977	1978	
Total	Domestic Output	40,804	63,622	53,215	60,034	83,359	77,787
	Imports	29,598	49,339	24,954	52,031	63,870	81,294
	Exports	40	32	8	16	32	40
	Domestic Distributing Volume	70,362	112,929	78,161	112,049	147,197	159,041

(Frozen Vegetable)

(Unit: tons)

Category		Year					
		1973	1974	1975	1976	1977	1978
Beans	Domestic Output	2,840	6,990	4,338	4,850	3,371	1,893
	Imports	-	-	-	25,473	31,017	34,336
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	2,840	6,990	4,338	30,323	34,388	36,229
Sweet Corn	Domestic Output	11,263	17,766	14,504	13,739	19,131	14,198
	Imports	-	-	-	5,932	9,657	14,355
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	11,263	17,766	14,504	19,671	28,788	28,553
Potatoes	Domestic Output	12,986	18,247	13,731	18,500	22,777	35,796
	Imports	-	-	-	5,970	8,851	16,404
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	12,986	18,247	13,731	24,470	31,628	52,200
Others	Domestic Output	13,715	20,619	20,642	22,945	38,080	25,900
	Imports	29,598	49,339	24,954	14,656	14,345	16,199
	Exports	40	32	8	16	32	40
	Domestic Distributing Volume	43,273	69,926	45,588	37,585	52,393	42,059

Note: 1) Domestic Distributing Volume = Domestic Output + Imports - Exports

Source: • Domestic Output - Japan Frozen Food Association
• Exports and Imports - "Monthly Report of Japanese Foreign Trade"

(Dried Vegetable)

Total	Domestic Output	5,214	4,910	6,069	7,718	8,074	8,581
	Imports	9,124	9,609	9,784	12,248	10,208	12,399
	Exports	177	285	113	249	208	211
	Domestic Distributing Volume	14,161	14,234	15,740	19,717	18,074	20,769
Bamboo Sprouts	Domestic Output	-	-	-	-	-	-
	Imports	4,370	3,773	3,434	4,307	3,488	4,352
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	4,370	3,773	3,434	4,307	3,488	4,352
Onion	Domestic Output	2,157	1,906	2,805	3,059	3,121	3,315
	Imports	1,256	1,520	2,078	1,771	1,498	2,144
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	3,413	3,426	4,883	4,830	4,619	5,459
	Domestic Output	3,057	3,004	3,264	4,659	4,953	5,266

(Dried Vegetable)

(Unit: tons)

Category		Year					
		1973	1974	1975	1976	1977	1978
Others	Imports	3,498	4,316	4,272	6,170	5,222	5,903
	Exports	177	285	113	249	208	211
	Domestic Distributing Volume	6,378	7,035	7,423	10,580	9,967	10,958

Note: Domestic Distributing Volume = Domestic Output + Imports - Exports

Source: ● Domestic Output - "Statistical Survey of Food Industry", issued by Food Marketing Research and Information Center
● Exports and Imports - "Monthly Report of Japanese Foreign Trade"

Remarks: Export Item - Garlic, Radish, Horseradish, Others

(Canned Vegetable)

Total	Domestic Output	103,441	103,165	118,925	116,319	132,222	123,791
	Imports	42,968	50,890	40,920	46,122	51,698	63,849
	Exports	1,212	1,048	687	448	392	361
	Domestic Distributing Volume	145,197	157,007	159,158	161,993	183,528	187,279
Bamboo Sprouts	Domestic Output	37,304	34,724	45,583	43,841	45,517	38,092
	Imports	22,595	28,909	28,013	30,098	28,774	40,952
	Exports	41	28	18	-	-	-
	Domestic Distributing Volume	59,858	63,605	73,578	73,939	74,291	79,044
Asparagus	Domestic Output	11,631	12,297	11,258	10,811	12,275	14,295
	Imports	3,089	4,200	2,002	1,672	2,764	2,045
	Exports	339	114	168	161	69	31
	Domestic Distributing Volume	14,381	16,383	13,092	12,322	14,970	16,309
Sweet Corn	Domestic Output	18,557	23,070	25,939	24,835	34,232	33,038
	Imports	9,334	9,300	4,818	3,728	4,758	5,983
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	27,891	32,370	30,757	28,563	38,990	39,021
Mushrooms	Domestic Output	5,469	4,256	2,726	2,489	3,146	2,708
	Imports	1,206	780	1,923	4,536	7,920	6,449
	Exports	653	760	417	2	1	3
	Domestic Distributing Volume	6,022	4,276	4,232	7,023	1,165	9,154
Green Peas	Domestic Output	8,522	5,103	5,562	5,542	5,157	4,590
	Imports	926	385	27	200	227	356
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	9,448	5,448	5,589	5,742	5,384	4,946

(Canned Vegetable)

(Unit: tons)

Category		Year					
		1973	1974	1975	1976	1977	1978
Young Corncobs	Domestic Output	-	-	-	-	-	-
	Imports	606	2,369	588	954	941	1,483
	Exports	-	-	-	-	-	-
	Domestic Distributing Volume	606	2,369	588	954	941	1,483
Others	Domestic Output	21,958	27,715	27,857	28,801	31,895	31,068
	Imports	5,212	4,947	3,549	4,934	6,314	6,581
	Exports	179	146	84	285	322	327
	Domestic Distributing Volume	26,991	32,516	31,322	33,450	37,887	37,322

Note: Domestic Distributing Volume = Domestic Output + Imports - Exports

Source: • Domestic Output - Japan Canned Food Association
• Exports and Imports - "Monthly Report of Japanese Foreign Trade"

VI. PERSONS AND ORGANIZATIONS CONTACTED

THAILAND

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Bangkok Chili Ltd., Bangkok

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Mrs. Dara Buangsuwan, Chief of Seed and Postharvest Pathology Branch, Department of Agriculture, Bangkok.

Mrs. Pivan Varangoon, Director, Agricultural Products Development Division, TISTR, Bangkok.

Siam Technology Co., Bangkok.

Villa Market Ltd., Bangkok.

USA

Albertson's Inc., Dublin, California.

American Pistachio Corporation, Brooklyn, New York.

Atlantic & Pacific Tea Co., Inc., Montvale, New Jersey.

Balfour, MacLaine International Ltd., New York.

Castle & Cooke, San Francisco, California.

Crop and Livestock Reporting Service, U.S. Department of Agriculture, Sacramento, California.

Dae-Julie, Inc., Chicago, Illinois

Del Monte Corporation, San Francisco, California.
Fleming Foods, Fremont, California.
JFC (Japan Food Co.), South San Francisco, California.
Johnson Nut Co., Hopkins, Minnesota.
Kern Foods, Inc., Industry, California.
Knudsen and Sons, Inc., Chico, California.
Libby, McNeill & Libby, Inc. Chicago, Illinois.
Lucky Stores, Inc., Dublin, California.
Mandalay Food Products Corporation, Burlingame, California.
Marketing New Service, U.S. Department of Agriculture, San Francisco,
California.
The Napoleon Company, Seattle, Washington.
Nishimoto Trading Co., South San Francisco, California.
Pacific Sales Ltd., Bellevue, Washington.
Real Fresh, Inc., Visalia, California.
Reese Finer Foods, Hayward, California.
Reese Finer Foods, Patterson, New Jersey.
S & W Fine Foods, San Mateo, California.
Safeway Stores, Inc., Oakland and Walnut Creek, California.
United Grocers, Richmond, California.
Universal Foods Corporation, Carlstadt, New Jersey.
Yeo Hiap Seng (USA) Inc., San Jose, California.

JAPAN

Japan Vietnam Trading Co., Tokyo.
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U.S. Embassy, Tokyo.

Mr. Dudley Williams, Former Director, Agricultural Attaches Office, U.S. Embassy, Tokyo.

Oriental Takase Corporation, Tokyo.

SCT (Siam Cement) Ltd., Tokyo.

Stauffer Chemicals Ltd., Japan.

Tosin Co. Ltd., Tokyo.

Tsurutani & Co. Ltd., Business Division, Tokyo.

HONG KONG

The Dairy Farm Group of Companies, Hong Kong.

ETS Ballande Asia Ltd., Hong Kong.

Mr. Damrong Vaivong, Trade Commissioner, Royal Thai Consulate-General, Hong Kong.

Park 'n Shop Supermarkets, Hong Kong.

Japanese External Trade Organization (JETRO), Hong Kong

SINGAPORE

Borneo Sumatra Trading Co., Singapore.

Jardine Marketing Services, Singapore.

Mr. A. Sommai, Consultant/exporter, Singapore.

Robertson Wilson Ltd., Singapore.

Yeo Hiap Seng Ltd., Singapore.

S.J. Low & Co.

Executive Resource, Singapore.

Mr. Voratep Wongvidtaya, Thai Commercial Trade Counselor, Singapore

PHILIPPINES

Mr. John Tennant, Industry Division, USAID/Philippines.

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