This is to certify that the

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Somporn Kongcharoenkiat

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Hugh E. Lockhart

Hugh E. Lockhart
Major professor

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SURVEY OF THAILAND MARKET FOR FOOD PACKAGING MACHINERY

By

Somporn Kongcharoenkiat

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ABSTRACT

SURVEY OF THAILAND MARKET FOR FOOD PACKAGING MACHINERY

By

Somporn Kongcharoenkiat

The survey is based on a mailed questionnaire which was designed to determine the attitudes and opinions of the Thai food industry about United States packaging machinery as compared to packaging machinery sold by other countries in order to provide information concerning the market potential for U. S. packaging machinery in Thailand.

Findings show Thai food industries put more consideration on after-sale service than on other factors when choosing a manufacture and less consideration on the price of machinery. The average performance of United States machinery was very good — 70.8% prefer U. S. machine performance — whereas preference for West German and Japanese machines was only 60.7% and 58.2%, respectively. But the installation time and ease of repair for U. S. machines were rated only fair, therefore some new market strategy (after-sale service and prompt delivery) is recommended.

TO MY DAD AND MOM

CHARN - SUWIMOL JIRAPONGSA

AND ESPECIALLY MY FIFTH SISTER

SIRIPORN JIRAPONGSA

FOR THEIR SUPPORT IN THIS STUDY

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INTRODUCTION

Thailand is a predominantly agricultural country which remains more than self sufficient in the production of foodstuffs for its population. As a result, food processing and packaging machinery is a sector of considerable importance in the Kingdom and one which seems to offer a good potential for development and expansion in the future. However, the potential of the Thai market for packaging machinery has not yet been seriously studied.

Purpose

This survey of the Thai market for food packaging machinery has a three-fold purpose: (1) to determine Thai food industry attitudes and opinions toward U. S. packaging machinery; (2) to compare U. S. packaging machinery to packaging purchased from other countries by Thailand; and (3) to provide information regarding the market potential for U. S. packaging machinery in Thailand.

Methodology

The findings and conclusion in this report are based on information derived from questionnaires mailed to approximately 150 representative Thai food industry companies and from a review of available secondary data. Five categories of food companies were represented in this survey; dairy products, fats and oils, beverages (alcoholic and non-alcoholic), sugar and confections, and canned foods. The secondary data were derived from official government and industry statistics and publications.

Two points should be emphasized with respect to the findings and estimates in this report:

(1) The product category "Food Packaging Machinery" is concerned with filling, labelling and wrapping machinery only.

(2) All values are expressed in U. S. $1.00 = Baht 20.00.

Country Background

Thailand (literally means Land of the Free), formerly Siam, is a constitutional monarchy located in Southeast Asia.

The country has a total area of 513,115 square kilometers (198,455 square miles) and is divided into 72 provinces. The capital is Bangkok with 4.7 million inhabitants. Thailand has a population of about 44.8 million with an average annual population growth rate of 2.6%. The population density is nearly 86 persons per square kilometer. [1]

Thailand is basically an agricultural country, with most of the country's total working population engaged in agricultural endeavors. Exports of agricultural products are currently the main source of foreign trade. The main crop in Thailand is "Rice." However rubber, maize, tapioca, and sugar have increased in production significantly over the past years. Primary processing plants for rice milling and oil extraction have long been in existence and require modernization. More recently, a number of modern processing plants (producing canned foods, sugar, etc.) have been established and are enjoying a flourishing market.

(1) National Statistical Office, Bulletin of Statistics, Vol. 25-26, No. 4, Dec. 1978, Office of the Prime Minister, Bangkok, Thailand.

FOOD INDUSTRY

Market Overview

Development of the food industry was, in the past, rather slow due to the preference of the Thai people for fresh food. Over the past decade, however, two factors have brought about a dramatic change in the attitude of Thai industrialists toward the concept of food processing and canning. The first is that, with the abundance of virtually every kind of fruit and vegetable growing in Thailand, many investors, both foreign and domestic, have become interested in capturing an increasing share of the export market. In order to compete in world markets, techniques and equipment for growing and processing food have necessarily improved.

The second factor is the increasing population and the migration of people from rural to urban areas. In order to feed the population in rapidly expanding urban areas, agro-industrial methods have had to be modernized, while transportation facilities linking the provinces with Bangkok have been improved.

The government has played an important role in the food processing industry. According to Thailand's Fourth National Economic and Social Development Plan for 1977-1981, both export earnings and imports were to be increased. During the Fourth Plan, exports are projected to increase at an annual rate of 14 percent while imports are projected to increase at an annual rate of 11.5 percent. The attainment of these Plan targets could help to strengthen Thailand's overall balance of payments position during the Plan period. To achieve these targets, emphasis has to be given to the expansion of agricultural and industrial production, particularly in the areas of fruit and seafood.

Currently, there are five distinct categories (previously mentioned) of factory food processing in Thailand. The foods involved are bought in the open market when supplies are abundant and prices low. Packaging plays an important role in these five industries, carrying food safely to local and export consumers during peak seasons as well as all year long.

The five sub-sectors of food processing are:

(1) Canned Foods

(2) Sugar and Confections

(3) Beverages (alcoholic and non-alcoholic)

(4) Dairy Products

(5) Fats and Oils

Canned Foods

The canned pineapple success story is by now well known. From very small beginings less than a decade ago, Thailand has grown to become the second largest exporter of canned pineapple in the world and this, by any standards, is a tremendous achievement. For example, export earnings of canned pineapple in 1977 were close to $45 million and in the following year pineapple exports reached the $50 million mark. (1) While production in other countries declined there seems to be no limit to the amount of pineapple Thailand can put on the world market, and it is now well accepted all over the world. Indeed, the U. S. is still by far the largest purchaser of canned pineapple, 43,000 tons in 1977. (2) The United States cannery in Thailand under the auspices of the Board of Investment, has an export/import privilege which provides tax-free imported machinery, but allows no canned pineapple to be sold in the domestic market.

(1) Division of Agriculture Economics, Agricultural Statistics of Thailand Crop Year 1977/78, Ministry of Agriculture and Co-Operations, Bangkok, Thailand 1978.

(2) The Investor, Vol 10(8), 1978.

The seafood industry in Thailand is well established and is an active and growing contributor to the drive for export. High priced frozen fish are finding the best foreign markets, Japan and the U. S., have a high demand for crustacea, especially shrimp. Actually most of the fish caught is incidental to the search for shrimp which is the big money earner. For example, Thailand catches about 1.5 million tons of seafood annually, of which only 4 percent is shrimp, but the cash value of shrimp is about one third of the total sales.

The canned seafood industry is dominated by an Australian joint venture company called SAFCOL which operates the largest seafood canning factory. Besides SAFCOL, there are about 20 to 50 smaller operators who produce canned sardines and mackerel for the local market. Because of competition from the fresh fish market for the most poular fish, SAFCOL concentrates on tuna canning for export markets. Current production stands at one million cans of seafood per month and sales are at present over $3 million per year. (1)

Sugar and Confections

At one point in Thailand's history, sugar was a larger earner of foreign exchange than anything else, but it has been gradually overtaken by rice and other commodities. In recent years, eight large factories have started to make western-style confections in Thailand. Each employs more than 80 workers. Production varies according to season, being lowest during school vacations and highest around the end of the year.

The leading firms use daily between 20.8 and 25.5 tons of sugar, six to 8.2 tons of glucose, and 310 to 360 kilograms of imported aromatic extracts. (2)

(1) Ivan Mudannayake, Editor in Chief, Thailand Year Book 1975-1976, Published by Temple Publicity Services.

(2) Siam Communications Limited, A Description of the Industrial Sector of Thailand, 2nd Edition, Jan. 1973, Bangkok, Thailand.

Beverages (alcoholic and non-alcoholic)

There are now 25 soft drink bottling plants around the country, of which 10 can be classified as major factories. Total output in 1973 was 950 million bottles, essentially equal to consumption. The bottler of Pepsi-Cola has the largest share of the Thai market at 37 percent. Other major bottlers are subsidiary companies of American companies such as Coca Cola and Seven-Up. Basic materials such as bottles, sugar and water are entirely derived from domestic sources, although the bottling companies are large importers of flavoring essences and sodium benzoate. Because of available ingredients and good marketing strategy it is not surprising to know that during the last decade approximately 9,000 million bottles of soft drink were consumed in Thailand. [(1)]

As far as beverage packaging is concerned, all the beverages packed are in bottles — all returnable bottles. Most of all beverages produced are consumed on the premises of a restaurant or store.

Distilling can only be undertaken with a government license. However, there are 35 small and six large distilleries spread out in the 72 provinces. The consumption of alcoholic beverages, other than beer, is increasing at an annual rate of 20 percent. [(1)] This calculation is based on sales records of the Bangyikhan distillery, the largest distillery, owned by the Ministry of Industry.

(1) Siam Communications Limited, A Description of the Industrial Sector of Thailand, Second Edition, January 1973, Allied Printers Limited, Bangkok, Thailand.

Regarding beer production, there are only two local breweries which supply 99 percent of the beer consumed in the country. As of December 1977, their total combined production for that year was 103 million liters. But this is only one fourth of their total production capacity. (1) The breweries are not worried, because the beer-drinking population of the country has expanded from nearly nil 20 years ago to a large percentage of total population now. Beer's further expansion is restricted by the high cost, in comparison to locally-made rice-whiskeys, and the slow growth of per capita income. Nevertheless, the industry foresees ever-expanding domestic consumption, particularly if tourism is vigorously promoted.

Dairy Products

Despite more than two decades of development, Thailand still spends more than $50 million each year to import milk powder and other dairy products. (2) This is basically because Thailand is not a good place to raise dairy cattle — the milk yields tend to be four to five times lower than in Europe and, therefore, cheaper products can be had if milk powder is imported and then recombined and reconstituted here.

(1) Center for Industrial Statistics, Information and Research, Industrial Statistics 1978, Vol. 6, Ministry of Industry, Bangkok, Thailand.

(2) The Investor, Vol. 10(8), 1978.

To do this, four milk canners exist, all of them now working at a reasonably high level of efficiency. Overall production is close to 5.5 million cartons of canned condensed milk a year and competition keeps prices below the official control level. Market growth, therefore, depends upon the ability of the milk canners to persuade Thais to drink more milk, while the fresh milk producers have pinned their hopes for greater sales on UHT (Ultra High Temperature) milk which is fresh but sterilized. But real growth in this sector can only be realized if Thailand is able to breed a cow that will yield large volumes of milk given the existing pasture and climate. Certain breeds can now produce close to half the amount a European milch cow produces so there is hope, but the process, even if successful, will take many more years.

Fats and Oils

Thailand is both an importer and exporter of vegetable oils, and an exporter also of the seeds, beans and nuts from which the oils are extracted. In 1977 exports brought in $46 million worth of foreign exchange. [1] Despite this, with the exception of castor beans, 75 to 100 percent of all oil-bearing seeds are consumed domestically. Only a fraction of the total vegetable oil which annually becomes available is exported.

In the past lard was used almost exclusively for cooking in Thailand, but the steadily increasing price of pork, nutritional concerns and the growing availability of vegetable cooking oils (notably those based on rice bran), have resulted in a decrease in the reliance on lard in the kitchen.

(1) Division of Agriculture Economics, "Value of Agricultural, Forestry and Fishery Exports, 1973-1977," Agricultural Statistic of Thailand Crop Year 1977/78, Ministry of Agriculture and Co-Operations, Bangkok, Thailand 1978.

FOOD PACKAGING EQUIPMENT

Sales of food packaging equipment in Thailand are now about 80 percent of the total packaging equipment,[(1)] as the country is continuing modernization and expansion of its food industry as mentioned. Factors such as the increasing cost of labor and the growing export orientation of Thailand's food processors also assure a good future in this field. Consequently, it is not surprising to find that the use of packaging equipment in the food industry had an annual growth rate of 46 percent during 1976-1979[(2)] (see Table 1).

The principal foreign suppliers of food packaging machinery to Thai end-users are West Germany, Japan, United States, Italy, Taiwan and some other countries of Western Europe. The Thai food processing industry presently purchases much low priced machinery from Japan and Taiwan; American firms compete with West German and Italian manufacturers for sales of more sophisticated items. Equipment made in the U. S. is considered price competitive with European goods, but has not, until recent years, become widely known among Thai end-users. As shown in Figure 1, the market share for the U. S. is only half the West German share.

(1) U. S. Department of Commerce, Foreign Market Survey, "Food Processing and Packaging Equipment - Thailand," August 1974.

(2) Foreign Trade Statistics of Thailand 1975-1979.

TABLE 1

THAILAND'S ACTUAL IMPORT OF FOOD PACKAGING EQUIPMENT

BY TYPE OF EQUIPMENT, FOR 1976-1979

(in thousands of U. S. dollars)

Type of Equipment	Thai Commodity Code	1976	1977	1978	1979
Filling, Closing, Sealing Equipment	841902	2,830	3,360	4,030	6,580
Wrapping, Packing Equipment	841903	930	4,370	4,460	3,800
Total		3,760	7,730	8,490	10,380
Average Annual Growth Rate			106%*	10%	22%

*There was a tremendous increase in wrapping, packing equipment imported from West Germany and Italy. Both were about 12 times more than the year before. It may be due to some financial aid programs rather than purchase by local food industries.

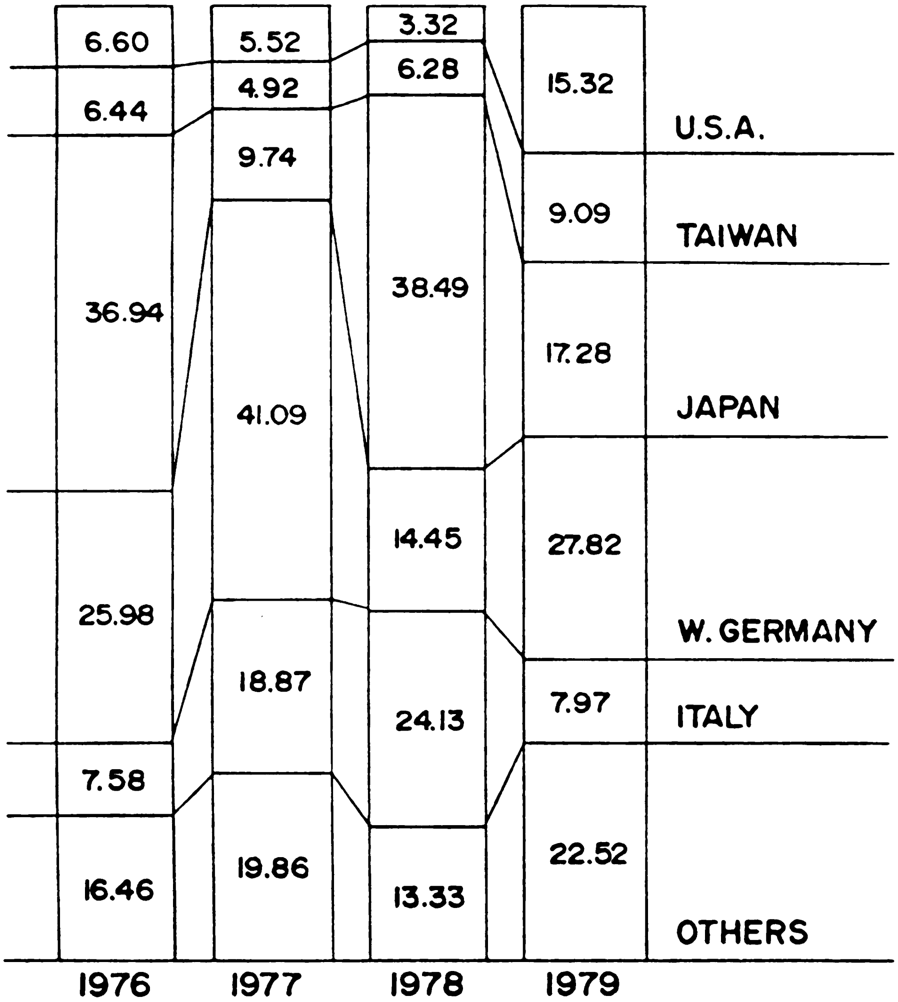
Source: Foreign Trade Statistics of Thailand, 1976-1979.

Footnotes: All figures are rounded-off.

FIGURE 1

THAILAND'S MARKET SHARES IMPORT OF FOOD PACKAGING EQUIPMENT BY COUNTRY OF ORIGIN, 1976-1979

(in percentage)



Source: Foreign Trade Statistics of Thailand, 1976-1979

Generally speaking, based upon the author's experience and conversations with packaging machinery salesmen and businessmen, it was found that the Thai industries have the opinion that United States packaging machinery is expensive, when compared to West German and Japanese packaging machinery.

The domestic manufacturers make only very simple machinery using locally acquired raw materials. This machinery consists primarily of the less important components in the total production process. The machinery is generally copied from West German, Japanese or Taiwanese machines and includes primary accessories and replacement parts for foreign made equipment. In fact, there are no foreign subsidiaries or licenses for manufacturing food packaging equipment in Thailand.

Nevertheless, the status of the market for U. S. packaging machinery in Thailand has not yet been seriously studied. Little good information was available for this study because secondary sources were developed for another purpose. Therefore, it was necessary to design and administer a questionnaire to obtain information primary sources, the companies that comprise Thai industry.

EXPERIMENTAL PROCEDURE

The trend toward establishing modern and efficient food packaging equipment is becoming more clearly evident due to the advance in the Thai food industry. In this survey, five of the most promising food industries were selected for study as follows:

(1) Canned Foods

(2) Sugar and confections

(3) Beverages (alcoholic and non-alcoholic)

(4) Dairy Products

(5) Fats and Oils

This survey was conducted by a mailed questionnaire which is divided into three parts according to the type of equipment, i.e., filling, labelling and wrapping machinery. Even though some of the respondents may read English, not all are of the same education level; therefore, the questionnaire was written in the Thai language.

Before the questionnaires were distributed to the target group, the author presented the propose of the questionnaire in a personal interview to the marketing manager of the Triangle Package Machinery Company, Limited and Peters Machinery Company, Limited, manufacturers of packaging machinery and located in Chicago, Illinois. As expected, the interviews indicated that some revisions had to be made in wording and structural clarity in order for the questionnaire to elicit meaningful responses.

Sampling Process

Population

Bangkok Metropolis is the area chosen to be sampled; Bangkok is the largest market in Thailand for industrial products, and most of the increase in the levels of agricultural and industrial production in the past were achieved in the area around Bangkok. By the end of the Third National Economic and Social Development Plan (1971-1976), the Bangkok area accounted for about 50 percent of the GDP (Gross Domestic Production) of the central region, and about 30 percent of National production.

Frame

Sample Frame is from Bangkok's Thai Yellow Pages Telephone Book, year 1980.

Unit

The sampling unit is by company name.

Sample Size

Thirty sampling units from each of the five types of food industries were selected as sample size based on the criteria of capital investment and production. A total sample size of 150 was used.

Selection of the Sampling Method

The questionnaire samples were picked out using judgment sampling, which is a nonrandom sampling plan and also known as purposive sampling. (1) The method of selection is based upon the judgment of the sampler who thinks that the result of the sample is representative.

(1) Albert Wesley Frey, "Marketing Handbook," Second Edition, 1969.

Time

During November and December 1980.

Based on the information from secondary data or publication and personal interviews with U. S. packaging manufacturers, the questionnaire was designed as shown in appendix 1. Before the questionnaires were mailed, an advance letter was forwarded. Following this, a questionnaire with the author's cover letter and author's advisor's letter was sent, and a third letter was sent as a follow-up letter.

Questionnaire sample in appendix 1 shows only the part for filling machines; the other two parts - labelling and wrapping machines, have the same questions as the filling machine's questionnaire. The only difference is just the title and machine type.

RESULTS AND DISCUSSION

The questionnaires were distributed to one hundred and fifty representative food industry companies in five different types of manufacturing. Of these, 31 were returned to the author. This represents a return of 21 percent which is an adequate response rate. According to Kracmar [1] this type of questionnaire has a response rate about 8-15 percent in developing countries. Of the 31 questionnaires returned, 30 were used in the analysis. The data is not applicable to all 150 food processor companies because five respondents did not answer the questions about size of company. They kept the information confidential, and the other 25 respondents were medium and large size companies. Most of the 120 food processor companies who did not return these questionnaires were small size companies, so the results may not be generally applicable to them.

As shown in table 2 the responses are varied by the type of industry. Based on the five representative industries, it was found that the beverage and canned food industires were the most frequent respondents in this research (about 57%), whereas the confectionery industry had the lowest response rate. This is probably due to the type of industry which is mostly operated by Chinese and is small scale.

(1) Kracmar, John Z., "Marketing Research in the Developing Country - A Handbook," Praeger Publishing, N.Y. 1971, pp. 54.

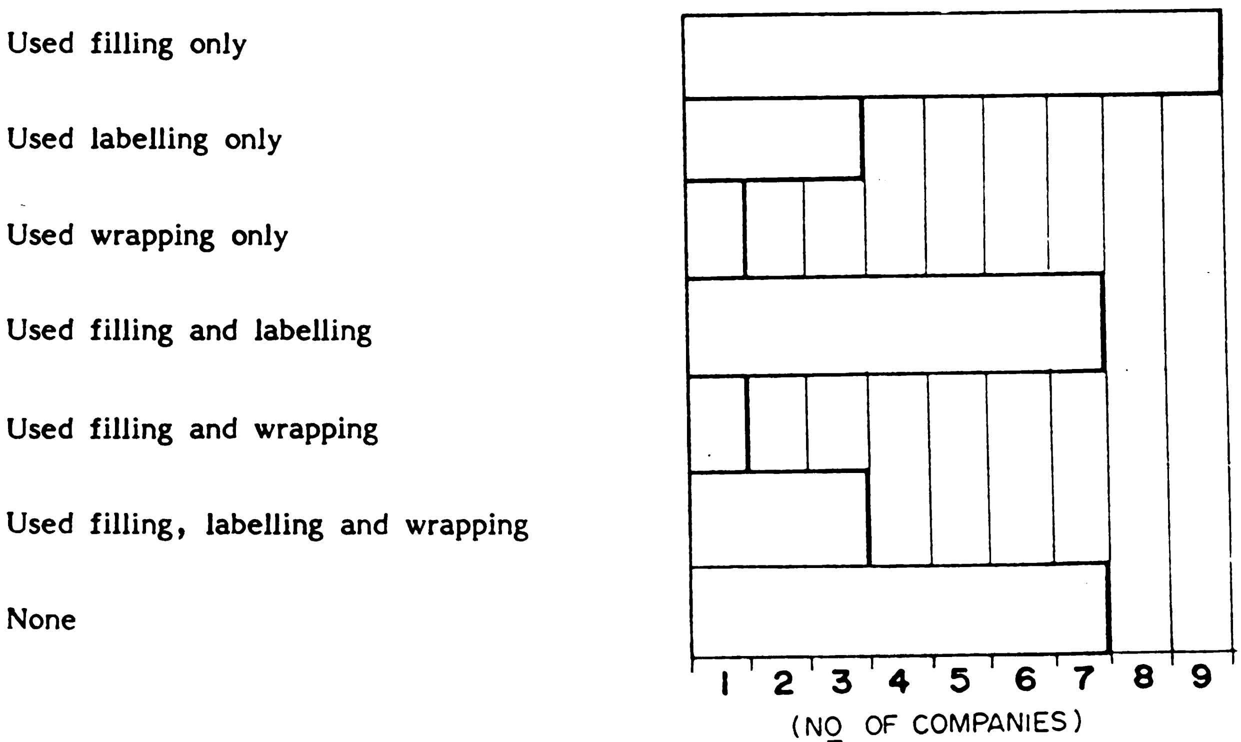
TABLE 2

RESPONSE TO THE QUESTIONNAIRE

Category	Sent Out	Returned	Percent of Total Returned
Dairy Product	30	5	16.7
Fat and Oil	30	5	16.7
Beverage	30	8	26.6
Confectionery	30	3	10.0
Canned Food	30	9	30.0
Total	150	30	100.0

FIGURE 2

NUMBER OF COMPANIES USING MACHINERY



Results

Question One and Two Summary

As a rule of thumb, the first question in a questionnaire should be simple and objective. Hence, questions one and two were designed to meet their objective by asking easy and straightforward questions. In the meantime these two questions also serve as a screen to identify the target correspondent. Question one asks, "Does your business deal with the food industry?" and question two asks, "What type of food business are you in?" The results of these two questions are shown in table 2.

Question Three Summary

By asking question three, "At the present time, in your business do you use any filling/labelling/wrapping machines?" we can categorize how many of the target companies have packaging machinery on the premises. As shown in figure 2, there are only seven out of thirty respondents who don't use any filling, labelling or wrapping machinery. On the other hand, it was found that filling and filling together with labelling machinery are the most used machines.

Question Four Summary

Question four asks, "How many filling machines are you using now?" From the results shown in table 3 the dairy and canned food industries use more machinery than the other industries concerned. The minimum numbers of filling, labelling and wrapping machines in use are 103, 26 and 22 machines, respectively. The filling machines are used more than any other type of packaging equipment. In my judgment, the reasons that filling machines are used more than other types of equipment, are probably due to government regulations concerning exact filling which can hardly be accomplished by manual-filling at the required speed, and the effect of using pre-labeled containers such as in beverage and dairy industries.

Table 3

MACHINERY USED BY SELECTED FOOD INDUSTRIES

No. of Machine		Dairy	Fat & Oil	Beverage	Confec-tionery	Canned	Total
Filling	1	-	1	2	-	-	3
	2-3	2	1	2	-	1	6
	4-5	1	-	1	-	1	3
	6-7	-	-	-	-	1	1
	8-10	1	-	2	1	2	6
	>10	1	-	-	-	1	2
Sub-total		5	2	7	1	6	21
Labelling	1	1	1	1	-	1	4
	2-3	1	1	-	-	3	5
	4-5	2	-	-	-	1	3
	6-7	-	-	-	-	-	-
	8-10	-	-	-	-	-	-
	>10	-	-	-	-	-	-
Sub-total		4	2	1	-	5	12
Wrapping	1	-	-	-	-	-	-
	2-3	-	-	-	1	1	2
	4-5	1	-	-	-	-	1
	6-7	1	-	-	-	-	1
	8-10	-	-	-	1	-	1
	>10	-	-	-	-	-	-
Sub-total		2	-	-	2	1	5
Total		11	4	8	3	12	38

Question Five Summary

Question five is the first question classifying the country of origin of the packaging machinery. Question five asks, "Is your filling/labelling/wrapping machine foreign made?" According to the response to this question, locally made packaging machines are not as popular as imported ones. There are not any locally made wrapping machines used by target companies, and only 14% and 18% of respondents claimed to use locally produced filling and labelling machinery, respectively. (see table 4)

Table 4

COMPARISON OF FOREIGN MACHINE TO THAI MACHINE

(in number of companies)

	Foreign		Thai		Total
Type of Equipment	No. of Companies	In Percentage	No. of Companies	In Percentage	In Percentage
Filling	19	86	3	14	100
Labelling	9	82	2	18	100
Wrapping	5	100	-	-	100

Note: Some companies use both foreign and Thai machines.

Question Six Summary

Question six is concerned with the origin of the imported machinery. Question six asks, "Where were your filling/labelling/wrapping machines made?" For all the imported machinery, the United States manufactured machines lead the filling machine market, followed by West Germany and Taiwanese. It is interesting to find that locally made labelling machines are quite popular. These are probably semi-automatic or manually fed machines. There is no dominant country as far as wrapping machinery is concerned. However, there are no locally produced wrapping machines being used by the represented firms. (see table 5)

Question Six-a, b and c

According to the secondary data in table 1, the principal machinery suppliers are West Germany, Japan and the United States. Therefore, questions six-a, b and c were introduced to compare the machinery performance of these countries in terms of installation time, efficiency, repair and satisfaction.

Generally speaking, the average performance of the United States machinery is favorable. By assigning a positive value to the positive performance and vice versa, we can say that 70.8% prefer the United States machine performance; whereas, preference for West German and Japanese machines is only 60.7% and 58.2%, respectively.

For those responding to the section concerning installation time, the United States machines met the scheduled installation as well as West German ones. However, overall ratings are suspect because 75 percent of users of West German machines and 42 percent of users of United States machines did not respond to the section of the question rating the company selling the machinery. The United States machinery has a slightly higher efficiency rating than West Germany's. Although the Japanese ones are rated the lowest in both installation time and efficiency, their machines were reportedly easiest to repair, followed by the United States and West Germany's. (see table 6)

TABLE 5

ORIGINS OF MACHINES USED

(in number of companies)

Country of Origin	Filling	Labelling	Wrapping	Total
United States	8	2	1	11
West Germany	7	3	1	11
Taiwan	7	1	1	9
Thai	3	4	-	7
Sweden	3	2	1	6
Swiss	2	2	2	6
Japan	3	1	1	5
Italy	3	-	1	4
France	2	1	-	3
Australia	1	1	1	3
England	-	-	1	1
Total	39	17	10	66

Note: Some companies use machines from more than one country.

TABLE 6

OPINION COMPARISON OF THE UNITED STATES,

WEST GERMAN AND JAPENESE PACKAGING MACHINERY

(by number of companies)

Opinion		Installation	Efficiency	Repair	Overall	Total
Best	-U.S.	4	6	3	5	18
	-W.Germany	4	5	2	4	15
	-Japan	1	1	2	1	5
Better	-U.S.	2	3	2	3	10
	-W.Germany	-	-	-	1	1
	-Japan	3	-	1	-	4
Good	-U.S.	1	1	3	1	6
	-W.Germany	-	1	-	-	1
	-Japan	-	1	2	2	5
Fair	-U.S.	-	-	1	1	2
	-W.Germany	-	-	-	-	-
	-Japan	-	3	1	3	7
Bad	-U.S.	-	-	-	-	-
	-W.Germany	-	-	-	-	-
	-Japan	1	1	-	-	2
Worse	-U.S.	-	-	-	-	-
	-W.Germany	-	1	-	-	1
	-Japan	-	-	-	-	-
Worst	-U.S.	-	1	1	1	3
	-W.Germany	-	-	2	1	3
	-Japan	1	-	-	-	1
No answer	-U.S.	3	1	1	1	6
	-W.Germany	3	-	3	1	7
	-Japan	-	-	-	-	-

Question Seven and Eight Summary

Questions seven and eight are intended to depict preferences for packaging machinery companies from different countries by asking "In your opinion, what is/are the best filling/labelling/wrapping machines you are using now? and followed by "In your opinion what is/are the poorest filling/labelling/wrapping machines you are using now?" The results indicate that the best rated filling machinery manufacturers nominated more than others were the United States manufacturers. The worst rated labelling machines were those produced by Taiwanese and Thai companies.

The reasons for the low level of response (60 percent to question seven and 10 percent to question 8) may be due to the lack of experience with machines produced by more than one country: therefore they have no basis on which they can claim machine manufacturer superiority or inferiority.

The best rated filling machines, classified by country of manufacturer and based on a 63 percent response rate to this question, are listed below.

	Manufacturer's Name	Country
1.	FMC	U.S.
2.	PFAUDLER	U.S.
3.	CROWN CORK AND SEAL	U.S.
4.	MEYER	U.S.
5.	CANGO	U.S.
6.	BERTUZZ	ITALY
7.	G.D.	ITALY
8.	PON-A-MOUSSON	FRANCE
9.	SMA DETREZ	FRANCE
10.	HAMAC HANSELLA	W.GERMANY
11.	TETRAPAK	SWEDEN
12.	SHIN-I MACHINERY WORKS	TAIWAN

The poorest rated filling machines were SHIN-I MACHINERY WORKS (TAIWAN) and Thai machinery.

The best rated labelling machines were based on a 55 percent response rate to this question.

	Manufacturer's Name	Country
1.	FMC	U.S.
2.	No manufacturer's name	U.S.
3.	PONT-A-MOUSSON	FRANCE
4.	SMA DETREZ	FRANCE
5.	SEITZ	W.GERMANY

The poorest rated labelling machines were the Thai machine.

The best rated wrapping machines were based on a 60 percent response rate to this question.

	Manufacturer's Name	Country
1.	FMC	U.S.
2.	G.D.	ITALY
3.	FIBRE KING	AUSTRALIA

It was a poor response rate to the poorest rated wrapping machinery category, this has been interpreted to mean that none can be considered to be the poorest.

Question Nine Summary

Question nine asks for the frequency rate of buying new filling, labelling or wrapping machinery. Question nine asks, "How often do you expect to buy new filling/labelling/wrapping machines?" The purchasing occurred approximately once in two or three years for filling machines, while purchasing of labelling and wrapping machines occurred more than once in three years. However, most of the respondents agreed that the purchasing decision depended upon the circumstances, for instance, expanded productivity, increasing demand, etc. (see table 7)

TABLE 7

FREQUENCY RATE FOR PURCHASING NEW MACHINERY

(by number of companies)

Frequency	Filling	Labelling	Wrapping
Once a year	2	-	-
Once in two years	3	-	-
Once in three years	3	1	1
Once in five years	2	2	1
Others	14	6	2

Question Ten and Eleven Summary

Question ten and eleven try to look for the probability of the present machinery user to repeat the purchasing order from the same manufacturer. The questions are "Will you decide to buy new filling/labelling/wrapping machines from the same manufacturer?" and "Why will you still purchase from the same manufacturer?" Results of open-ended question ten shows the majority of filling and labelling machine users will purchase new machines from the same manufacturer; while the probability of the wrapping machine user buying new machinery from the same manufacturer is still questionable (see table 8). The reasons for repeating order through the same manufacturer are:

1. Efficiency and performance of machine are satisfactory.
2. Familiarity with the machine, ease of repair when the machine breaks down.
3. Convenient to keep spare-parts.
4. Good service of machine by manufacturer or agency.

TABLE 8

DECISIONS TO REPURCHASE FROM MANUFACTURER

(by number of companies)

Answer	Filling	Labelling	Wrapping
Yes	13	4	1
No	3	2	1

Question Twelve Summary

Question twelve asks, "What are the most important factors in your decision when purchasing new filling/labelling/wrapping machines?" Of the 19 questionnaire responses to this question, 13 reported that the most important factor when choosing a manufacturer is service, followed by availability of spare-parts, durability and maintenance cost, respectively.

Question Thirteen Summary

Question thirteen asks, "How will you purchase your filling/labelling/wrapping machines?" As far as the purchasing process is concerned, the majority of machine users (70%) prefer to purchase directly from the machine manufacturer.

Question Fourteen Summary

Question fourteen applied the projective technique, which is based upon the concept that the description of imagined events require interpretation; and this intrepretation can only be based on the individual's own background and attitude (see Appendix I). By using the cartoon drawing of a two person conversation, the reply of the second person concerning purchasing machinery from the Rickermann Company, Limited, would be supplied based on the attitude of the respondent. The key word in this question is "Rickermann," which is the name of a Thai based trading agency, who is one of the pioneers and a well known imported Western packaging machinery trading firm in Thailand. The purpose of this question is to evaluate the opinion of respondents about purchasing machinery from a local trade representative or agency.

Based on 17 responses to this question, the answers can be grouped into three categories as follows:

1. Fifty-three percent of the respondents strongly believed that it was a good idea to buy through Rickermann. The major reasons are: the financial plan provided, a good reputation in Thailand and a fast delivery time.

2. Forty-one percent were not interested in the agency through whom machines were sold but, instead, were more interested in details of the machine such as brand name, speed and price.

3. Only one respondent refused to buy machinery from Rickermann due to "high" price.

Question Fifteen, Sixteen and Seventeen Summary

The rest of the questions are for classification data. Question fifteen asks, "How much production capacity per year does your business have?" Question sixteen asks, "What were your total gross sales last year?" Question seventeen asks, "How many registered assets does your business have?" As mentioned before, a majority of the respondents are from large-scale industry. For example, registered assets vary from $12,500 to $22.5 million, and gross sales from $250,000 to $50 million per year. Answers regarding the production capacity of the respondent's plant in question 15 were difficult to analyze because the amount of production was answered in various units such as in dollar value, cases, cans, tons, etc.

Discussion

The thirty valid questionnaires, together with secondary data, can be discussed according to the objectives of this study as follows:

(1) Status of United States Packaging Machinery in Thailand

(2) Factors Influencing Packaging Machinery Purchasing Decisions in Thailand

(3) Potential of Thailand's Market for Food Packaging Machinery

Status of United States Packaging Machinery in Thailand

By assuming that the national industrial growth rate and political situation were in the same trend, imported packaging machinery, using linear regression analysis, is projected to be $17 million in 1983. And the major market share leaders will still be West Germany and Japan. Based on the actual import of food packaging machinery in 1979 the market shares of West Germany and Japan were 27.82% and 17.28%, respectively; and the market share of the United States was only 15.32% in spite of the reputation of United States packaging machinery.[(1)] Nevertheless, based upon the results of this survey, U.S. machinery performance is rated at a high level (see question six-a, b and c). Besides, most of the respondents named U.S. equipment as the best machinery more than any non-U.S. brands, and none of the U.S. machinery was named as the poorest. This indicates that the United States packaging machinery is quite well recognized and accepted in Thailand (see question seven).

For filling machinery the United States reputation is strong and the U.S. has the larger market share. For other packaging machinery, such as labelling and wrapping machines, the larger market share is held by West Germany, Taiwan and even the local quality labellers.

As far as performance is concerned, United States machinery was rated highest in efficiency and overall performance, but the installation time and ease of repair were rated only fair. In this situation, if United States packaging machinery suppliers would like to increase their market share in Thailand, some new market strategy such as after-sale service, an important factor to Thai industries, would have to be implemented (see question twelve). It would be wise also to improve delivery and installation performance as well as instruction of personnel.

(1) Foreign Trade Statistics of Thailand 1976-1979.

<u>Factors Influencing Packaging Machinery Purchasing Decisions in Thailand</u>

From the questionnaire responses, the machinery users can be grouped into three categories in terms of the type of machine in use:

(1) Industries that used only low cost machinery - local or Taiwanese machinery.

(2) Industries that have both low cost and more sophisticated Western Machinery such as West German and Italian.

(3) Industries that have experience with all machinery from different sources including United States machinery.

It was found that most industries which have not had any experience with United States machinery, believe that the machines with a satisfactory operation performance on their premises are the best machines. In this situation, it is a must for the United States manufacturer to overcome the prevalent opinion that the United States is expensive. Instead, stressing the longer life, and if possible, assured demonstration of the machinery would be a very good strategy to penetrate the market.

One of the most interesting things found in this research is that service has been considered to be the most important factor in the purchase of a new machine. Also, the majority of the respondents (50%-80% depending upon the type of equipment), insisted that they would buy new machines from the same suppliers. In this situation service should be used as a strategy either to penetrate or expand the market or maintain present customers for purchase repetition. However, some other factors such as availabitliy of spare parts and machine durability also have to be considered.

According to the responses to question thirteen, 70% of all the respondents prefer to buy directly from the manufacturer. But question fourteen, which used the projective technique to evaluate opinion regarding purchasing machinery from an agency, indicated that 53% of the respondents agreed that they would buy from the agency. In this contrast, it may be suggested that the majority of the food industries would like to buy machinery directly from suppliers, but it is difficult to do so in reality due to a lack of specific technical knowledge of the machinery or the part of the users. A reliability of delivery and spare parts availability are reasons for purchasing from an agency that will assure instruction and parts. The agency also offers a financial plan and guaranteed delivery time. This is why packaging machinery brokers are quite popular in Thailand.

Potential of Thailand's Market for Food Packaging Machinery

According to this study, a majority of the surveyed industry has approximately 2-3 packaging machines on the premises and usually purchase equipment every 3-5 years; because of this, Thailand's packaging market seems to be growing at a slow rate. The only thing that may assure United States machinery manufacturers of favorable sales prospects are growth and expansion of the Thai food industry. Fortunately, an ambitious export target (1977-1981) which requires packaging, such as sea foods and pineapple, has been attained with 14.4% and 16.0% export increases. Together with a promotion of the Thai Board of Investment, which granted import and export tax exemptions, packaging for exported food products looks promising. As a result these industries are putting less consideration on the price of machinery, which is the favorable point for the United States machinery manufacturer, compared to West Germany and Japan.

Labelling and wrapping machinery have a good potential, especially since the cost of labor in Thailand during the past three years has almost doubled. According to the attitude of the respondents, the predominant opinion in the market place is that the United States has very good technology and offers modern and versatile equipment. The only minor obstacle to the United States sales has been slow delivery, therefore every effort should be made to assure prompt delivery.

From the questionnaire results, the total minimum number of filling, labelling and wrapping machines in use is 151 machines and 27% of the respondents would purchase new machines every three years or less. Then, it is a good estimate that the number of machines to be replaced should be 40 machines in the next 3 years or by 1983. Since the annual growth rate is running at about 10%, it is a reasonable estimate that the number of new machines to be added in the Thai food industry should be 45 machines by 1983. Therefore, by 1983 the projected market for the total minimum number of filling, labelling and wrapping machines to be purchased by these 30 companies will be 85 machines or an average of 28 machines per year. This number will be larger when the total Thai market is considered. (This sample of companies is a small percentage of total Thai food industry companies.)

CONCLUSION AND RECOMMENDATION

Mechanization has been rapidly accepted by the local food processing industry because of the growing export orientation and the increasing inflation rate, which is reflected in higher labor cost. Consequently, the prospect for more food packaging machinery to be imported from the United States is good.

The market for food packaging equipment grew between 1977-1979, at an average rate of 11.2% annually. The total value of machines purchased in the earlier year was approximately $7.7 million; by 1979 the value had grown to $10.3 million, and it is expected to reach $17 million in 1983. The United States packaging equipment had a market share of about 15.32%, or just over $1.5 million, of all imported packaging equipment in 1979, and their share should rise to 20%, or over $3.4 million, in 1983.

According to this study, the purchasing occurred approximately once in two or three years for filling machines while purchasing of labelling and wrapping machines occurred more than once in three years. The majority of machine users also prefer to purchase directly from the machine manufacturer. We saw that the total minimum number of filling, labelling and wrapping machines now in use is 151 machines. These companies' projected market for both new and replacement machines should increase to 85 machines by 1983; therefore there is a sizeable market for machines on a continuing basis. Since the U.S. market share is projected to be 20%, U.S. manufacturers should be able to sell at least 17 machines in Thailand. What might U.S. manufacturers do to improve their shares of selling 17 or more machines in Thailand? Some suggestions follow.

Until now, the market has been dominated by European manufacturers (especially West Germany) and the much cheaper Japanese and Taiwanese machinery. Therefore, it is especially important for the U.S. to overcome the prevalent opinion that U.S. machinery is expensive and to take advantage of the opportunity to be found in its good reputation in Thailand by stressing quality and long term durability. How can this be done? Some new market strategies - such as after-sale service, a primary factor for Thai companies, prompt delivery with installation and, if possible, assured demonstration of the machinery - would be a very good way to penetrate or expand the market or maintain present customers for purchase repetition. These strategies can be accomplished in two alternatives. First, U.S. packaging machinery manufacturers can use a company such as Rickermann as an agent in Thailand; but in my opinion, this will not work because Rickermann itself sells the major market share of the imported Western European packaging machinery market. They would not want to compete with themselves. Second, U.S. packaging machinery manufacturers can ask another agent such as East Asiatic Company, Limited to be their agent or representative in Thailand, to compete with the established agency - Rickermann Company, Limited. But in reality, it is quite difficult for a U.S. packaging manufacturer's agency to do better than the present agency in the next few years, owing to their good reputation, goodwill and prestige of 30 years in Thailand. Even if successful, it will take many more years of experience.

We found that the majority of machine users said they prefer to purchase directly from the machine manufacturer. In Thailand, there is a general lack of knowledge of packaging technology, including packaging machinery specification. This stiuation forces end-users to purchase through an agency which causes a larger time to break even and higher maintenance costs. Hence, there is a need for technical knowledge to be made available directly to many packaging machinery users. For this, there should be a center where these users can obtain required knowledge, names and addresses of machinery suppliers, specifications and training. In this regard, the majority of suppliers also can co-operate in this center. The direct benefit to Thai businessmen is to reduce the higher cost of machines by eliminating the middle-man (agency) and purchasing directly through the manufacturer. This can reduce the deficit of Thailand's Balance of Trading. A center in Thailand could be established by a U.S. packaging machinery manufacturer; this would represent a high investment cost. Or the Thai Packaging Association could organize a center for Thai industries to provide the desired information, but the association is too small to achieve this goal. More likely, however, a center could be created with the Thai Government's support. As a result, the packaging technology standard would be undoubtedly higher.(1)

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APPENDIX 1

Advance Letter

Somporn Kongcharoenkiat
1717/1 Chun Rd., Bangkok 12

November 3, 1980

Dear Manager,

At the present time, packaging machinery is very well accepted by the food industry. As a matter of fact, the decision of where and when to buy is varied depending upon the company's executives.

As a graduate student at the School of Packaging, Michigan State University, The United States, I would like to ask you to participate in a special survey of the Thai market for food packaging machinery. Your company was chosen by sampling from Bangkok's Yellow Pages Telephone Book, year 1980.

In a few days you will receive a questionnaire. It will only take a short time to complete, and your answer will be completely confidential.

I will be most grateful for your co-operation.

Sincerely yours,

(Somporn Kongcharoenkiat)

Cover Letter

Somporn Kongcharoenkiat
1717/1 Chun Rd., Bangkok 12

November 10, 1980

Dear Manager,

I would like to ask your co-operation in completing the enclosed questionnaire. I am studying the Thai food industry attitudes and opinions toward the United States packaging machinery, and the future marketing potential for packaging machinery in Thailand. The questionnaire consists of three parts: filling, labelling and wrapping machinery.

Will you please complete the enclosed questionnaire as soon as possible and return it in the enclosed, stamped envelope by November 25, 1980? Please answer only those questions pertaining to your company; even if you don't use any packaging machinery or are not concerned with the food industry, please return this questionnaire.

You can be sure that all your information will be used only for research purposes and will not involve you in any further committment.

I will be most grateful for your help.

Sincerely yours,

Somporn Kongcharoenkiat

(Somporn Kongcharoenkiat)

MICHIGAN STATE UNIVERSITY

SCHOOL OF PACKAGING · TELEPHONE (517) 355-9580 EAST LANSING · MICHIGAN · 48824

October 8, 1980

To Whom It May Concern:

Somporn Kongcharoenkiat is a graduate student working under my direction at the School of Packaging. We are trying to determine the market for packaging machinery manufactured in the United States of America. Since Mrs. Kongcharoenkiat is a native of Thailand, she is well equipped to conduct our investigation in your country. For this reason, I have asked her to conduct this questionnaire survey. Please answer all of the questions that apply to your company. It will be very helpful to me.

Sincerely,

Hugh E. Lockhart

Hugh E. Lockhart
Professor
School of Packaging

HEL:mc

Follow-up Letter

Somporn Kongcharoenkiat
1717/1 Chun Rd., Bangkok 12

December 8, 1980

Dear Manager,

Recently I asked you to participate in a special survey. If you were among the many who have already answered please consider this my way of saying "Thank You."

If, on the other hand, you did not have a chance to fill out the form when you first received it, perhaps you will be so kind as to fill it out now. Your response will remain confidential, you can be sure that all your information will be used only for research purposes and will not involve you in any further committment.

Your help is sincerely appreciated.

Sincerely yours,

Somporn Kongcharoenkiat

(Somporn Kongcharoenkiat)

Note: The questionnaire was written in the Thai language. There are three parts of the questionnaire one each for filling, labelling, and wrapping machines. This questionnaire sample shows only the part for filling machies, the other two parts have the same questions as the filling machine's questionnaire. The only difference is just the title and machine type.

PART I. FILLING MACHINE

1. Does your business deal with the food industry?

   ___ Yes

   ___ No (if not, cancel this questionnaire)

2. What type of food business are you in?

   ___ a. Dairy Product

   ___ b. Fat and Oil

   ___ c. Beverage (alcoholic and non-alcoholic)

   ___ d. Canned Food

   ___ e. Confectionery

   ___ f. Others (please specify) ________________

3. At the present time, in your business do you use any filling machines?

   ___ Yes

   ___ No (if no, go to Part II)

4. How many filling machines are you using now?

   ___ a. 1

   ___ b. 2-3

   ___ c. 4-5

   ___ d. 6-7

   ___ e. 8-10

   ___ f. >10

5. Is your filling machine foreign made?

   ___ Yes

   ___ No (if no, skip Question 6)

6. Where were your filling machines made? (You can circle more than one answer).

___	a.	U.S.	(go to Question 6-a)
___	b.	England	
___	c.	West Germany	(go to Question 6-b)
___	d.	Italy	
___	e.	Sweden	
___	f.	Japan	(go to Question 6-c)
___	g.	Taiwan	
___	h.	Others (please specify) ________________	

6-a. If you purchased any machines from the United States, place a check mark on the horizontal line at the point which best describes your experience with these machines. Please mark between and not on the short vertical lines.

Machine was installed on time.	|___|___|___|___|___|___|___|	Machine could not be installed on time.
Machine worked as efficiently as expected.	|___|___|___|___|___|___|___|	Machine did not work as efficiently as expected.
Machine broke down, was easy to repair.	|___|___|___|___|___|___|___|	Machine broke down, was difficult to repair.
Overall machine performance was satisfactory.	|___|___|___|___|___|___|___|	Overall machine performance was not satisfactory.

6-b. If you purchased any machines from West Germany, place a check mark on the horizontal line at the point which best describes your experience with these machines. Please mark between and not on the short vertical lines.

Machine was installed on time.	|___|___|___|___|___|___|___|	Machine could not be installed on time.
Machine worked as efficiently as expected.	|___|___|___|___|___|___|___|	Machine did not work as efficiently as expected.
Machine broke down, was easy to repair.	|___|___|___|___|___|___|___|	Machine broke down, was difficult to repair.
Overall machine performance was satisfactory.	|___|___|___|___|___|___|___|	Overall machine performance was not satisfactory.

6-c. If you purchased any machine from Japan, place a check mark on the horizontal line at the point which best describes your experience with these machines. Please mark between and not on the short vertical lines.

Machine was installed on time.	|___|___|___|___|___|___|___|	Machine could not be installed on time.
Machine worked as efficiently as expected.	|___|___|___|___|___|___|___|	Machine did not work as efficiently as expected.
Machine broke down, was easy to repair.	|___|___|___|___|___|___|___|	Machine broke down, was difficult to repair.
Overall machine performance was satisfactory.	|___|___|___|___|___|___|___|	Overall machine performance was not satisfactory.

7. In your opinion, what is/are the best filling machines you are using now?

	Name of Manufacturer	Country
a.	____________________	__________
b.	____________________	__________
c.	____________________	__________

d. None can be considered as the best.

8. In your opinion, what is/are the poorest filling machines you are using now?

	Name of Manufacturer	Country
a.	____________________	__________
b.	____________________	__________
c.	____________________	__________

d. None can be considered as the poorest.

9. How often do you expect to buy new filling machines?

___ a. Once a year

___ b. Once in two years

___ c. Once in three years

___ d. Once in five years

___ e. Others (please specify) ______________

10. Will you decide to buy new filling machines from the same manufacturer?

___ Yes

___ No (skip Question 11)

11. Why will you still purchase from the same manufacturer? (Please explain)

____

12. What are the most important factors in your decision when purchasing new filling machines?

	Most Important		No Opinion	Least Important	
a. Cost	___ 1	___ 2	___ 3	___ 4	___ 5
b. Service	___ 1	___ 2	___ 3	___ 4	___ 5
c. Speed	___ 1	___ 2	___ 3	___ 4	___ 5
d. Maintenance cost	___ 1	___ 2	___ 3	___ 4	___ 5
e. Delivery time	___ 1	___ 2	___ 3	___ 4	___ 5
f. Durability	___ 1	___ 2	___ 3	___ 4	___ 5
g. Obsolescence	___ 1	___ 2	___ 3	___ 4	___ 5
h. Availability of repair part	___ 1	___ 2	___ 3	___ 4	___ 5
i. Frequency of break-down	___ 1	___ 2	___ 3	___ 4	___ 5
j. Reference group	___ 1	___ 2	___ 3	___ 4	___ 5
k. Reputation	___ 1	___ 2	___ 3	___ 4	___ 5
l. Financial assistance	___ 1	___ 2	___ 3	___ 4	___ 5
m. Others (please specify)	___ 1	___ 2	___ 3	___ 4	___ 5

____

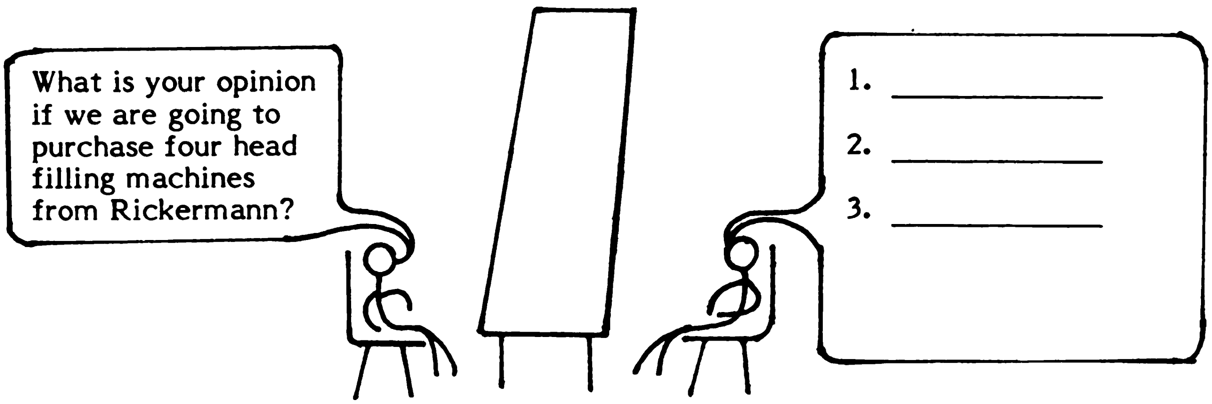
13. How will you purchase your filling machines?

___ a. Purchase directly from machine manufacturer.

___ b. Purchase through local trade representative or agency.

___ c. Others (please specify) ____________________

14. In this picture of two people conversing, the first one says, "What is your opinion if we are going to purchase four head filling machines from Rickermann?" What do you think the other person would answer?



To help us know a little more about your company, please answer the last part of this questionnarie as accurately as possible. May I emphasize again - this information will be used for educational purposes only.

15. How much production capacity per year does your business have?

____

16. What were your total gross sales last year?

____

17. How many registered assets does your buesiness have?

____

Thank you very much for your co-operation.