

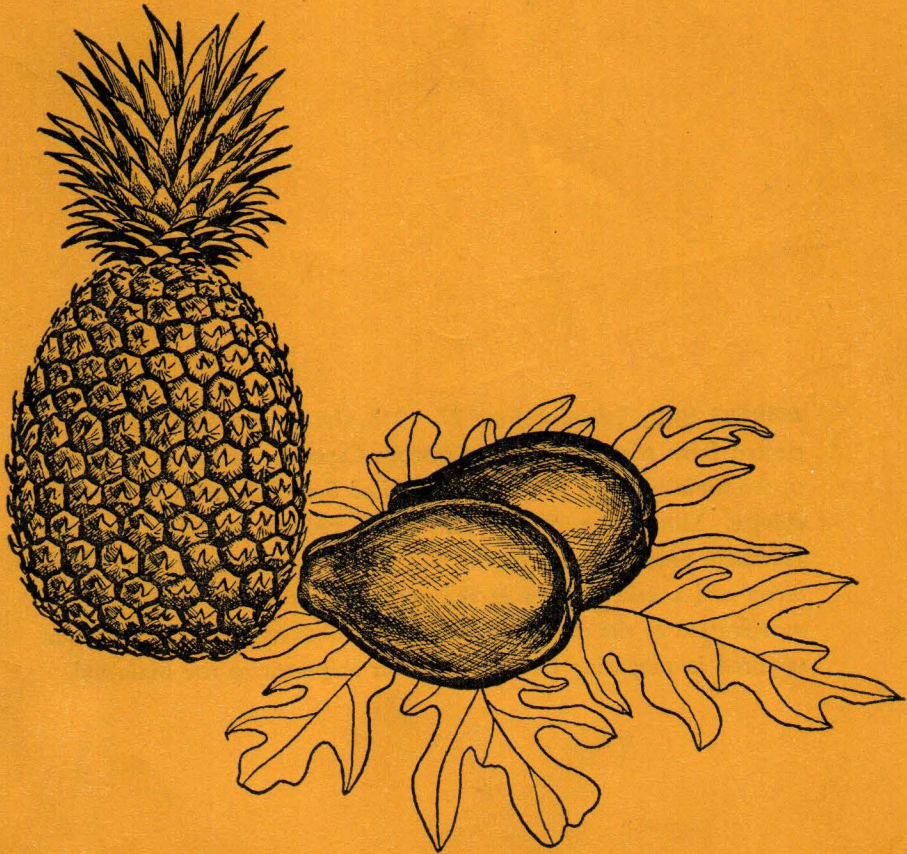
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**MARKETING FRESH HAWAIIAN**

# **PAPAYAS AND PINEAPPLES**

**ON THE MAINLAND**

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C. W. PETERS is Agricultural Economist with the Hawaii Agricultural Experiment Station. The author wishes to acknowledge the substantial assistance of MISS ALICE KONO, Economic Assistant, who participated actively in all phases of the research project on which this report is based.

**AUTHOR'S NOTE**—Effective June 27, 1953, the ban on shipment of untreated fresh pineapples of the smooth Cayenne variety from Hawaii to the Mainland was lifted by the United States Department of Agriculture. Elimination of the fumigation process in preparing fresh Hawaiian pineapples for export will result in some reduction of both direct and overhead costs in the packing operations. This particular modification of the quarantine regulations does not alter the treatment required in preparing fresh papayas for shipment to the Mainland.

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## ABSTRACT

After falling off to negligible amounts during and immediately following World War II, exports of fresh papayas and pineapples from Hawaii are again assuming commercial importance. Shipments of these fruits, mostly to California markets, have now reached the point where they are about equal to the maximum rate reported just before World War II. In 1952 exports of fresh papayas totaled 384,000 pounds, whereas shipments of pineapples reached 2,577,000 pounds. There has been a steadily developing interest in the possibilities of further expansion in this trade with the Mainland. In considering the potentialities of fresh papayas and pineapples in the export trade, there has been a need for more factual information on margins and costs involved in moving these commodities from Hawaii to consumers on the Mainland. In response to this need, data on retail and wholesale margins have been obtained in the major Pacific Coast markets, and other major marketing costs have been measured as they occur in moving the fruits from fields in Hawaii to receivers on the Mainland.

Retail margins on the specific lots of fresh papayas traced through trade channels averaged 35.8 percent of the selling price in Pacific Coast cities during March 1953. The margin on fresh pineapples was only slightly lower at 34.7 percent. Prices to consumers during the same period were 44.7 cents and 18.4 cents per pound for papayas and pineapples, respectively. As a group, chain stores had the lowest retail prices on both fruits and were also taking the least margin on selling price. Both fruits are considered as "specialty" items by the retail trade on the Mainland, and only those stores located in relatively high income areas carry fresh Hawaiian papayas and pineapples regularly.

Wholesale margins averaged 19.8 percent for fresh papayas and 15.1 percent for fresh pineapples. These margins are based on the prices paid by the retailers. When related to the prices paid by the consumer, these charges for services of the wholesalers absorb 12.8 cents and 9.9 cents of each dollar spent for papayas and pineapples, respectively. With few exceptions these fruits are handled on a consignment basis by mainland receivers. Commissions paid the initial receivers range from 12 to 15 percent. Other costs, such as the markup taken by jobbers, are responsible for the excess of the average wholesale margins over the commission rates of the receivers.

Transportation to market required an outlay of 3.48 cents per pound of fresh papayas shipped to the Pacific Coast markets during March and April 1953. This cost was 2.83 cents per pound for fresh pineapples. The bulk of this item is ocean freight, but an important, though frequently overlooked, charge is cartage at the port of destination. In relation to the consumer dollar, transportation took 7.8 cents on papayas and 15.2 cents on pineapples. The lower unit value of pineapples is responsible for the larger share of retail required to cover transportation of that fruit.

Assembly and packing costs, including the packing materials, totaled 4.83 cents per pound of papayas exported by the major Hawaiian shippers from January through May 1953. On pineapples this cost aggregated 2.60 cents per



pound. Converted to the consumer price basis, these costs accounted for 10.7 cents of each retail dollar spent for papayas and 14.1 cents of each dollar spent for fresh pineapples. In terms of labor requirements, the in-plant packing operations of the shippers surveyed required an average of 93 man minutes per 100 pounds of papayas packed. Pineapples required an average of 22 man minutes for the same operations. On the basis of the range found from plant to plant in both monetary cost and man minutes, it is evident that a substantial saving would accrue to the local shippers if each would adopt the most efficient individual methods now used by the several packers. Further gains are possible through better plant arrangement and improvement of facilities. In each case the decision on major adjustments in the physical plant is contingent on the question of whether the present and potential volume of produce to be handled will justify the additional investment.

In relation to the retail dollar, the raw fruit itself represented 16.8 percent of the price paid by the mainland consumer for fresh papayas. For fresh pineapples the grower of the fruit received 14.1 percent of the consumer's dollar. During March 1953 papayas for export were returning about 7.5 cents per pound at the farm, whereas pineapples were ranging from 2 to 3 cents per pound, depending upon location and point of purchase.

On the basis of export shipments in March 1953, the local packers received 16.1 cents of each dollar spent by the mainland consumer for fresh papayas from which to pay for fumigation, to cover overhead expenses, and to realize a margin of profit. On fresh pineapples this residual to the packer was 12 cents per dollar of retail sales. These margins were equivalent to 7.2 cents per pound for papayas and 2.2 cents per pound for pineapples. The mainland market for both fresh papayas and fresh pineapples was stable in March 1953, and prices were satisfactory from the standpoint of the shipper in Hawaii. This residual can, and often does, shrink very quickly if the market is "off" for a few weeks. In the latter circumstances the margin of profit may be eliminated completely, and the residual may not be sufficient to cover the full cost of fumigation and overhead.

Demand for fresh papayas and pineapples in the Pacific Coast markets is quite elastic. This means that within reasonable limits the markets will absorb increased quantities without a proportional decrease in price. Conversely, when supplies decrease, the price does not advance in direct proportion. It is the consensus of the mainland trade that increased quantities of fresh papayas and pineapples can be sold if the price is brought within reach of more consumers and if quality is maintained at satisfactory levels. The optimum selling prices mentioned most frequently by retailers were 29 cents per pound for papayas and 15 cents per pound for pineapples. With a moderate reduction in retail margins, these suggested prices would not be too far out of line with the minimum returns that Hawaiian shippers consider necessary if exports of fresh papayas and pineapples are to be profitable to themselves and to the fruit growers. Retailers and wholesalers alike expressed strong endorsement of an expanded market development program for fresh fruits from Hawaii.



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## **MARKETING FRESH HAWAIIAN PAPAYAS AND PINEAPPLES ON THE MAINLAND**

### **INTRODUCTION**

Papayas and pineapples have been shipped in the fresh form from Hawaii to the Mainland for many years. It is known that pineapples from the Islands have been found intermittently in West Coast produce markets since the late 1840's, antedating the initial development of pineapple canning by some 30 years. Papayas do not have such a long history in the Hawaiian export trade, but records are available in which experimental shipments of this fruit in the early 1900's are described. Shortly after 1900 the Hawaii Agricultural Experiment Station conducted a number of studies in the marketing of Hawaiian fruits, including fresh papayas and pineapples. In the case of these two fruits, the record of shipments in the fresh form is extremely variable from one period of time to another and is generally very sketchy in content. Shipments of these fruits and other produce in the fresh form have often been interrupted for varying periods of time because of plant quarantines and shipping difficulties, the latter stemming mostly from strikes and wartime restrictions.

Immediately prior to World War II there occurred a promising resurgence of export trade in both fresh papayas and fresh pineapples. This development was brought to a practical standstill by wartime shipping and supply difficulties. After 1946, when the Oriental fruit fly was discovered in the Territory, export shipments of fresh produce soon reached the point of being negligible. This continued decline may be attributed largely to the tight quarantine imposed by governmental agencies and to difficulties experienced in devising a satisfactory fumigation process. By 1948 sufficient progress had been made in fumigation technique, however, that the quarantine on export shipments was eased for some produce, including fresh papayas and pineapples. Export shipments of both papayas and pineapples have increased steadily since 1949, and the volume of these fruits now being shipped to the Mainland is again up to a level comparable to that attained just before World War II. Approximately 192 tons of papayas and 1,288 tons of pineapples were exported in the fresh form during 1952. Substantially all of these shipments were channeled through West Coast ports and found their way into consumer centers in the western states, where California is the major outlet. The San Francisco and Los Angeles areas alone are accounting for over 90 percent of the sales of Hawaiian papayas and pineapples that are shipped in the fresh form.

From 1900 to 1915 the Hawaii Agricultural Experiment Station engaged in several research projects that were aimed at improvement of the marketing process involved in moving fresh fruits from the Islands to mainland markets. Data relating to the effect of those studies in terms of change in volume or quality



of fruits exported are not available. With the imposition of a strict quarantine on these fruits in 1914, further research in this particular field of marketing apparently came to a halt. It was not until the late 1930's, when the quarantine was relaxed, that much interest in such marketing research was revived. After a few years of renewed activity the studies were again terminated because shipments fell off so rapidly after 1941. Coincident with the development of a practical fumigation process and partial relaxation of the quarantine in 1948, there was a marked expansion of research and service work in the whole field of marketing in relation to the sale of fresh fruits and vegetables from Hawaii in mainland markets.

Since 1950 the University of Hawaii, with financial assistance from the Industrial Research Advisory Council (Territorial) and the Research and Marketing Act (Federal), has carried on several programs of research and service designed to support and facilitate the marketing of fresh papayas and pineapples on the Mainland. In most cases these projects have emphasized fumigation techniques, grading, condition and handling of the fruits, and expansion of the export market. The study on which this report is based had as its purpose the measurement of costs and margins involved in moving fresh papayas and pineapples from Hawaii to mainland consumers. Costs incurred from the time the fruit leaves the point of production in the Islands until it reaches the initial receiver on the Mainland are expressed primarily in terms of average monetary outlay by the major packers now engaged in the export trade. Packing costs are stated also in man minutes wherever that method of measurement has proved practicable. Margins at the wholesale and retail levels are based upon the average spreads taken by representative dealers in major Pacific Coast markets. An inquiry was also made into the general market situation of the Pacific Coast as it affects Hawaii's export trade in fresh papayas and pineapples. Suggestions and recommendations based upon the writer's observations during the course of the study and a summary of trade reactions representing the concensus of the numerous industry people from whom data were obtained are used to supplement the statistical record of costs and margins.

### **PRICES AND MARGINS**

During the month of March 1953, a survey of representative retailers and wholesalers who handle fresh Hawaiian papayas and pineapples was conducted in the Los Angeles, San Francisco, and Portland areas. Specific lots of these fruits were traced from the wholesale to the retail levels. It was possible to obtain a broader sample for pineapples because a considerably greater number of retailers customarily stock this item, and further, in March 1953, it happened that papayas were in very short supply on the coast as a result of a temporary production slump in Hawaii. Substantially all initial receivers of the two fruits in the Los Angeles, San Francisco, and Portland markets, as well as a number of jobbers, co-operated in providing information on the wholesale prices of the 66 lots of pineapples and 34 lots of papayas that were traced successfully through trade

channels to the retail outlets. As there were no papayas on the market in Portland at the time of the survey, it was necessary to restrict price and margin observations on that fruit to the two California areas. This is not a particularly serious restriction on the scope of the study, because California accounts for such a large part of the shipments of fresh papayas and pineapples from Hawaii.

Margins taken by receivers and/or jobbers consist, for the most part, of the usual commissions taken by the distributors. Papayas and pineapples shipped fresh from Hawaii are almost always handled on a consignment and commission basis. Except in Portland, it was noted that the great bulk of Hawaiian papayas and pineapples, particularly the latter, found their way directly from the initial receivers to the retail outlets without being handled by intermediate jobbers other than the produce departments of chain organizations. Portland was the exception in that all Hawaiian papayas and pineapples, other than a small quantity sold directly to chains, are generally routed from the receivers or distributors through fruit and vegetable jobbing houses which, in turn, supply the retail trade. Jobbers, of course, take a markup to cover their services.

#### **PAPAYA PRICES AND MARGINS (tables 1 and 2)**

In 34 retail outlets located in Los Angeles and San Francisco, that were surveyed in March 1953, it was found that the average price of fresh Hawaiian papayas was 44.7 cents per pound. The range in the average was from 43.0 cents per pound in Los Angeles to 47.1 cents per pound in the San Francisco area. Isolated cases of prices as high as 89 and 98 cents per pound were discovered. The lowest prices at retail were from 35 to 39 cents per pound. The average prices of 43.0 and 47.1 cents in the two major California markets represented margins on selling of 33.1 percent and 39.4 percent, respectively. The average margin for both markets was 35.8 percent, which represents a markup on cost of about 56 percent. Markups on cost of less than 35 percent were found, but they were few in number.

Chain stores, as a group, offered the lowest retail prices on papayas and also had the narrowest margins. Their average of 37.6 cents per pound and 31.4 percent margin was several points below the comparable figures for other types of food stores. Specialty fruit and vegetable stores topped the list with an average price of 59.4 cents per pound and a 44.8 percent margin. A casual comparison of these extremes indicates that the stores with lower prices and margins are buying their produce more advantageously on the wholesale market. For example, if the retail price is 37.6 cents per pound and the margin is 31.4 percent, then the cost is 25.8 cents per pound; whereas, if the retail is 59.4 cents per pound and the margin is 44.8 percent, the cost must be 32.8 cents per pound.

Wholesale prices paid for fresh papayas purchased by the 34 retail outlets surveyed during March 1953 in the Los Angeles and San Francisco areas averaged 28.7 cents per pound. This price is equivalent to the average retail price of 44.7 cents diminished by the 35.8 percent margin taken by the retailers. As is mentioned above, the margin realized by the wholesaler for his marketing services usually represents a combination of commission paid the initial receiver and markup

Table 1. Average retail and wholesale prices and margins on fresh Hawaiian papayas and pineapples in Pacific Coast cities, March 1953.

Marketing Area	Papayas*		Pineapples†	
	Price per pound	Margin on selling	Price per pound	Margin on selling
	<i>cents</i>	<i>percent</i>	<i>cents</i>	<i>percent</i>
<b>Retail</b>				
Los Angeles .....	43.0	33.1	19.3	37.5
San Francisco .....	47.1	39.4	16.7	30.2
Portland .....	—	—	19.3	29.9
All areas‡ .....	44.7	35.8	18.4	34.7
<b>Wholesale</b>				
All areas .....	28.7**	19.8††	12.0**	15.1††

\* Based on sampling of prices on 34 lots (18 in Los Angeles and 16 in San Francisco) traced from wholesale to retail level in March 1953. No papayas were on the market in Portland at the time of the survey.

† Based on sampling of prices on 66 lots (29 in Los Angeles, 27 in San Francisco and vicinity, and 10 in Portland) traced from wholesale to retail level in March 1953.

‡ Averages weighted by volume shipped to each area involved during January-March 1953.

\*\* Represents average retail price less margin taken by retailer.

†† Margin realized by receivers and/or jobbers on price paid by retailer. Includes deduction for sales promotion on all papayas shipped to Calavo, Inc.

taken by jobbers wherever they are involved in the marketing process. Commission on Hawaiian papayas varies from 12 to 15 percent. The average wholesale margin of 19.8 percent thus reflects the net effect of the jobbers' markup and, in the case of fresh papayas, the charge for market promotion added to the commissions of the receivers. It should be noted that the wholesaler's margin is expressed as a percentage of his selling price to the retailer and thus represents less than 13 percent of the consumer price. Among the charges included in the wholesale margin is the allowance of 1 cent per pound that Calavo, Inc., receives for sales promotion purposes on all papayas marketed through that channel. Calavo, Inc., serves as the initial receiver for most fresh papayas shipped from Hawaii to the Mainland.

#### PINEAPPLE PRICES AND MARGINS (tables 1 and 2)

Fresh Hawaiian pineapples were traced through trade channels to 66 retail outlets in the Los Angeles, San Francisco, and Portland areas. The average consumer price in the three markets was 18.4 cents per pound with a retail margin of 34.7 percent on selling price. This margin of 34.7 percent is equivalent to slightly over 53 percent markup on cost. The average retail price of 19.3 cents per pound in Los Angeles and Portland is some 15 percent above the average of 16.7 cents found in the Bay area. Two chain organizations were primarily responsible for the lower price level in and near San Francisco. For all 66 outlets surveyed, the usual range of fresh pineapple prices from store to store was 17 cents to 23 cents per pound, with a distinct tendency to cluster around the midpoint. At the same time the range in percentage margins is quite extreme in the sense of wide fluctuations being found from one store to another in any given classification of



retail outlet. A few extreme cases were noted in which margin taken by one store is double that found in another unit. Although Portland had the same average retail price as Los Angeles, the margin in the Northwest was much less and, in fact, about the same as in San Francisco. The obvious explanation lies in the higher price paid for fresh pineapples by Portland retailers and their apparent effort to hold consumer prices down to the California level.

Retail prices of fresh pineapples did not show a particularly broad dispersion when averaged by store types. The range was from a low of 18.0 cents for chain stores to a high of 19.7 cents for the general or miscellaneous group, the latter being made up, for the most part, of neighborhood food stores. The lower average consumer price found in the chains, together with their lower average margin, probably indicates more advantageous buying at the wholesale level. Independent supermarkets and stores in the "general" classification had average margins of 39.5 and 38.9 percent, respectively. It is significant that the average price of 18.4 cents per pound and the average margin of 34.7 percent are only slightly above the group averages reported for the chains alone and not far out of line with the averages for specialty fruit and vegetable stores. This result is not unexpected in view of the sales distribution pattern for both fresh papayas and fresh pineapples shipped to the West Coast from Hawaii. Particularly in southern California, the chains and specialty stores are handling a major part of these shipments from the Islands.

During the survey period the average wholesale price of fresh Hawaiian pineapples sold to retailers in the Los Angeles, San Francisco, and Portland areas was 12 cents per pound. This price represents the average retail price of 18.4 cents reduced by the 34.7 percent margin taken by retailers. The margin taken by handlers (i.e., receivers and jobbers) at the wholesale level, averaged 15.1 percent of the price paid for the fruit by the retail outlets. When applied to the total price paid by consumers, this margin at wholesale amounts to slightly less than 10 percent of retail. Relatively fewer pineapples than papayas are sold to retailers through

Table 2. Average retail prices and margins on fresh Hawaiian papayas and pineapples in Pacific Coast cities, by type of stores, March 1953.

Store type	Papayas*		Pineapples†	
	Price per pound	Margin on selling	Price per pound	Margin on selling
	<i>cents</i>	<i>percent</i>	<i>cents</i>	<i>percent</i>
Chain .....	37.6	31.4	18.0	33.1
Independent supermarket .....	48.0	38.1	19.5	39.5
Specialty‡	59.4	44.8	18.9	34.5
Other**	51.0	38.9	19.7	38.9
All stores .....	44.7	35.8	18.4	34.7

\* Based on sampling of prices on 34 lots traced from wholesale to retail level in the Los Angeles and San Francisco areas in March 1953. No papayas were on the market in Portland at the time of the survey.

† Based on sampling of prices on 66 lots traced from wholesale to retail level in the Los Angeles, San Francisco, and Portland areas in March 1953.

‡ Stores specializing in fruits and vegetables.

\*\* Mostly independent neighborhood food stores.

jobbers who take a markup over receivers' prices; thus, the average margin at wholesale on pineapples is much closer to the regular commission of 12 to 15 percent that is taken by the initial receivers in the West Coast markets. Another factor explaining this lower wholesale margin is the sales promotion allowance on papayas that does not apply to fresh pineapples.

#### TRADE ATTITUDES AND OPINIONS

An average markup on cost of about 55 percent for both papayas and pineapples is relatively high, even for fresh produce which traditionally carries a higher margin than most other food items. All the retail outlets covered in this survey were questioned about the relationship of markup on papayas and pineapples to the usual margins realized on the entire line in the produce department. Over half the retailers maintained that they priced these fruits in the same manner as other produce items. A few said that they used a lower markup on papayas and pineapples because they were trying to stimulate the use of these fruits by their customers and, at the same time, speed up the turnover rate on the perishable commodities. Those dealers who were admittedly using a relatively high markup rate on papayas and pineapples usually gave as their reasons one or more of the following factors:

1. Fresh papayas and pineapples are specialty items that appeal only to a special class of trade and are, therefore, slow moving.
2. Both fruits, but particularly papayas, are very perishable, and spoilage loss is high. This reason appears to be overrated since the great majority of retailers surveyed indicated spoilage losses of less than 5 percent.
3. Papayas and pineapples are considered by retailers as high margin items on which a dealer has a chance to even up some of the very low margins taken on highly competitive staple produce.

In appraising the reaction of retailers to the good and bad features of fresh Hawaiian papayas and pineapples, there are several points on which there seems to be general agreement. It was the consensus of the trade that the quality of the Hawaiian fruit has improved greatly since 1949, when papaya and pineapple shipments were resumed in volume. At least part of the credit for spoilage losses averaging less than 5 percent in some three fourths of the stores surveyed must be attributed to better quality of fruit. At present prices, it must be recognized that both Hawaiian papayas and pineapples in the fresh form are, in fact, beyond the reach of the large group of mainland consumers who are in the lower income brackets. This does not imply that such people will never buy a papaya or a pineapple, but it does seem likely that regular purchases would be improbable. Large chains with units in all sections of a metropolitan area such as Los Angeles simply do not stock fresh papayas and pineapples in those stores serving the lower income districts. This policy is not believed to be the result of any preconceived notion on the part of the central management but rather appears to have developed from actual experience with the fruits in the various units. It was found that the income status of the clientele served had a similar effect upon the handling of fresh Hawaiian fruits by independent stores.

Almost without exception, retailers expressed an active interest in expansion of dealer service and market development work such as that carried on since 1951 under the auspices of the Agricultural Extension Service of the University of Hawaii and the Industrial Research Advisory Council of the Territory of Hawaii, as well as that financed by the industry itself through the arrangement for promoting papayas through Calavo, Inc. It was pointed out time and again that only a few consumers on the Mainland have more than a meager knowledge of what fresh papayas and pineapples are and how they are to be used.

Under the 1953 demand conditions, it was the view of retailers covered by this survey that a substantially greater volume of fresh Hawaiian papayas and pineapples could be moved into consumption on the West Coast if the retail price of papayas could be reduced to 29 cents per pound and that of pineapples brought down to about 15 cents per pound. Outside of price, the factor mentioned most frequently as a prerequisite to a broader acceptance of Hawaiian fresh fruits on the Mainland was maintenance of uniformly high quality standards. Some fruits are still arriving in poor condition with a consequent short shelf-life that often leads to a bad reaction on the part of both dealers and consumers. A third comment offered by a number of retailers and wholesalers, particularly the latter, concerned the need for maintaining a more steady flow of fresh papayas and pineapples from Hawaii to mainland markets. Once a market has been established, much of the gain made in building up trade and consumer acceptance is quickly lost if for some reason the supply of the commodity involved is either cut off entirely or is subject to violent fluctuations. Shipping strikes, storms, and other conditions that affect the flow of fresh fruits from Hawaii to the Mainland have reacted adversely in the effort to expand export markets for such commodities as papayas and pineapples.

### **TRANSPORTATION TO MARKET**

Since Hawaii is located 2,000 miles from the Mainland, it is not surprising that transportation is one of the major expenses incurred in moving fresh fruits to markets on the Pacific Coast. It is not generally realized, however, that ocean freight is just one of the transportation charges involved in this movement. In addition to the cost of moving fresh papayas and pineapples by steamship, there is also the expense of hauling the packed fruit to the local docks for loading aboard ships. At destination the cartage from the dock to the initial receiver is a significant item of cost; in fact, in the case of papayas this cartage is almost 50 percent of the charge for ocean freight.

Based on the net weight of the fruit shipped, it was found that transportation to market was costing \$3.48 per hundred for papayas and \$2.83 per hundred for pineapples (see table 3). Hauling from the local plant to the dock was 11.5 cents per hundred for papayas but only 5.5 cents for each 100 pounds of pineapples shipped. This difference is attributable mostly to the fact that pineapples are hauled in larger lots and to a lower relative weight of packing materials used in preparing pineapples for export. Ocean freight ranged from \$2.20 to \$2.30 per 100 pounds of fruit shipped, with the higher figure for papayas resulting



directly from the higher relative tare weights on packed containers of that fruit.

In the ports of Los Angeles, San Francisco, and Portland the average cartage from dock to initial receiver amounted to \$1.06 per 100 pounds net of fresh papayas and \$0.57 per 100 pounds net of fresh pineapples. As in the case of hauling to the local docks, the lower cost on pineapples is the result of the larger quantities handled and the relatively lower tare weight found in packed containers of fresh pineapples.

During the period of this survey, the opportunity to observe waiting time at the local docks was afforded each time a load of packed fruit was followed to the pier. With very few exceptions, the loaded truck was not kept waiting for more than 30 minutes before unloading began. Well over half the observations involved waiting time of less than 15 minutes. The longer periods of waiting were in connection with shipments of the open-type containers which, under quarantine regulations, are required to be loaded directly aboard ship with a minimum of delay between the truck and the reefer space on the ship. On the basis of experience during this survey period, it would be concluded that waiting at the dock until permission is received to begin unloading is not an important factor in determining the cost of hauling fresh papayas and pineapples to the local docks in Hawaii.

### PACKING COSTS

During the period of this study, there were six plants in the Islands that were engaged regularly in packing fresh papayas and pineapples for shipment to the Mainland. Two of these plants handled both fruits, three specialized in pineapples, and one packed papayas only. From the standpoint of location, the heavy concentration of packing activities was on Oahu, where four of the establishments are located. The islands of Hawaii and Kauai had one plant each. From January through May of 1953, the packing operations of all six major plants in the Territory were observed at first hand. A detailed record was kept of monetary costs and labor requirements involved in moving fresh papayas and pineapples from the point of production through the packing process to dockside at the port of shipment. In treating labor requirements, the recording of average time consumed

Table 3. Costs of transporting fresh papayas and pineapples from Hawaiian packers to Pacific Coast receivers, in dollars per 100 pounds of fruit shipped, March-April 1953.

	Papayas	Pineapples
Hauling from plant to dock .....	.115	.055
Ocean freight to Pacific Coast .....	2.303	2.205
Cartage from dock to receiver .....	1.064	.568
Total .....	3.482	2.828

Note: The costs listed above are based upon the net weight of the fruit shipped and are, therefore, greater than rates applicable to gross packed weight on a per-pound basis. For example, as of March 1, 1953, the base rate for tropical fruits moved from Hawaii to West Coast ports in refrigerated steamship space was \$1.90 per hundred gross weight.

in the various operations was limited to those functions performed in handling the fruit itself from the time it was received until it was loaded out for shipment. Labor was consumed in the performance of several other functions, such as assembly and box making, but for the purposes of this project it was not deemed practicable to measure labor requirements *per se* other than those of the regular packing house operations.

When so few firms are available for observation in such a very limited geographical area as Hawaii, it is particularly necessary to avoid presentation of cost data in such a way that identities would be apparent to anyone familiar with the local industry. For this reason the costs and labor requirements of the papaya and pineapple packers are stated as ranges and averages only. Despite the limitations of this method, it is still possible for anyone within the industry to evaluate his own operations in light of the range and average. As far as this project is concerned, the weighted average of costs is the increment of most interest at the packing house level in the over-all process of measuring costs and margins between the grower and the consumer. Actual wages paid were used in determining labor costs. This adherence to the actual wage scales, which differed considerably from plant to plant, results in some variations between the range in monetary cost of an operation and the range in time required to perform that same job.

In developing the schedule of cost items to be considered during the observation of packing house operations, there appeared, at first, to be considerable justification for making separate classifications of fumigation expense and overhead. It soon became apparent, however, that extreme variations in operating methods would preclude any accurate allocation and breakdown of such expenses during the limited period of time available for this study. Labor utilized in the fumigation process is included among the direct labor requirements discussed in this report.

## PAPAYAS

### DIRECT COSTS AND LABOR REQUIREMENTS

In the three plants that regularly pack fresh papayas for shipment from Hawaii to the Mainland, there are a number of differences in handling methods and in certain processes. Basically, however, the steps through which the fruit passes between the farm where papayas are produced and the local docks where filled cartons are loaded aboard ships are the same in all three cases. For this reason, the functions performed and expenses incurred at the packer level may be segregated quite readily into the uniform classifications that are described in this section. These descriptive paragraphs follow the tabulation contained in table 4.

*Assembly.* Papayas are moved by truck from the orchards to the local packing plants. The fruits intended for export are almost always given special handling to prevent bruising. Sometimes each fruit is wrapped in newspaper at the farm, or the field lugs are lined with shredded paper. This item of cost is relatively high for papayas because the load size is usually below the capacity of the trucks used and the extraordinary care required in handling the fruit results in added labor charges. The range in assembly cost, which includes loading at the orchard,

Table 4. Direct costs and labor requirements of packing papayas shipped from Hawaii in the fresh form, in cents and man minutes per 100 pounds of fruit packed, January-May 1953.

	Cents		Man minutes	
	Range	Average	Range	Average
Assembly* .....	54.4-122.1	66.5	—	—
Receiving .....	3.9- 5.5	4.4	2.7- 3.7	3.0
Grading and loading fumigation chamber .....	23.8- 56.8	48.9	16.9- 43.0	34.8
Unloading chamber .....	3.8- 5.4	4.1	2.6- 3.8	2.8
Packing and storing .....	65.0- 82.8	69.4	45.1- 60.0	49.1
Loading out .....	2.7- 6.6	5.5	1.8- 4.1	3.3
Packing materials .....	206.6-316.0	263.1	—	—
Making boxes .....	14.0- 41.2	21.5	—	—
All plants .....	374.2-636.4	483.4	69.1-114.6	93.0†

\* Includes loading and transporting fruit from orchard to packing plant.  
 † Represents direct labor required in packing plant operations only.

hauling to the packing plant, and partial unloading of the fruits at destination, was from \$0.54 to \$1.22 per 100 pounds of fruit packed by the three plants, the weighted average being 66.5 cents per 100 pounds. The major determinants affecting this particular cost are load size in relation to truck capacity and distance of haul, with adjustment of the former offering the best possibilities for achieving greater efficiency.

*Receiving.* As papayas are unloaded from trucks at the packing plant, they are moved in stacks by hand truck or are carried, one lug at a time, to the point where they are sorted and graded or otherwise prepared for treatment and/or fumigation. The average cost of this operation per 100 pounds of fruit packed was from 3.9 to 5.5 cents, with the average for all three plants being 4.4 cents. Labor required to perform this function ranged from 2.7 to 3.7 man minutes per 100 pounds of fruit packed. The average labor input in this activity was 3 minutes per 100 pounds handled.

*Grading, and Loading Fumigation Chamber.* This is one of the major steps involved in the packing of papayas. Its importance is indicated by the magnitude of both the monetary cost and the labor requirements. Cost per 100 pounds of fruit packed ranged from 23.8 to 56.8 cents, and the average was 48.9 cents. Labor utilized at this stage varied from 16.9 to 43.0 man minutes per 100 pounds of fruit. The average labor input was 34.8 man minutes per 100 pounds packed. Grading of papayas for export consists of sorting the individual fruits according to the quality and size of each. It is strictly a hand operation, as each fruit must be examined by the workers. The graded fruit is placed in a lug box, and these boxes are then carried or moved by hand truck or roll conveyor into the position where the fruits are treated and/or fumigated.

The fumigation process which is required because of quarantine restrictions on certain plant materials shipped from Hawaii to the Mainland varies from plant to plant. One packer uses a hot water treatment and fumigation with ethylene dibromide gas, the second fumigates with ethylene dibromide only, and



the third has developed a vapor heat treatment. Except in the case of the hot water treatment, which requires an added handling of the fruit, the differences in the fumigation process itself do not significantly affect the direct labor cost at this stage of the packing process.

If this cost is to be reduced, it is essential that the workers involved be given thorough training in grade requirements and size categories. A further need in this operation is to reduce to an absolute minimum the handling of the papayas and to shorten the distance between the grading location and the point where the fruit is fumigated or otherwise treated. A more thorough job of selecting fruit at the time it is being harvested should also be effective as a means of reducing the cost of grading in the packing plant.

*Unloading Chamber.* After papayas have been through the fumigation process, they are moved in the lug boxes to the packing room. This operation is usually accomplished through use of a hand truck or roll conveyor. Cost of removing the fruit from the fumigation chamber varied from 3.8 to 5.4 cents per 100 pounds of fruit packed. The average for the three plants was 4.1 cents per 100 pounds. Man minutes required in this step ranged from 2.6 to 3.8 per 100 pounds packed, with the average 2.8. Of the methods now used, a roll conveyor from the chamber into the packing room appears to be the most efficient means of moving the fruit.

*Packing and Storing.* Equipment now being used in packing papayas is extremely simple, and it represents only a small outlay in capital investment. The most elaborate arrangement consists of individual packing benches for the workers, overhead compartments for shredded paper or excelsior, and a roll conveyor over which the packed boxes move to the scales and the place where they are sealed. At the extreme of simplicity in these plants is the use of an ordinary flat table for each packer. In all cases the fruit to be packed is stacked near the individual packers, and empty cartons are also piled nearby. After papayas are packed in fiberboard cartons, practically all of which contain 10 pounds of fruit, these packed boxes are moved into cold rooms to be held until they can be loaded aboard ship. Labor involved in the operation of packing and storing ranges in cost from 65.0 to 82.8 cents per 100 pounds packed. The average cost of this activity was 69.4 cents per hundred. In terms of labor input per 100 pounds packed and stored, the time expended varied from 45.1 to 60.0 man minutes, the average being 49.1 man minutes.

At the present time the packing of papayas is essentially a hand operation in which each fruit must be handled individually in order to minimize bruising. The very nature of this fruit is such that semimechanical packing equipment, such as that used for apples and pears, would not be well adapted for local use. Special mechanical equipment could undoubtedly be designed that would improve the efficiency of packing. The cost of such machinery would probably be prohibitive unless a packer could handle a considerable volume of fruit. It does appear entirely practicable, however, to improve present packing equipment so that the individual workers would have better access to fruit and packing materials and less difficulty in handling the packed containers. Aside from improvement of the packing

equipment itself, greater efficiency at this stage could best be realized through improved arrangement of the packing line in relation to the fumigation or treatment chamber and storage space. There is also opportunity to lower costs by shifting physical arrangement so fruit will be routed in a more direct line through the entire plant.

*Loading Out.* The last of the packing house operations is the loading out of packed fruit for movement to the point of shipment. In the case of papayas, the packed boxes are removed from the cold room, loaded on trucks, and hauled immediately to the local docks for loading in refrigerated space aboard ship. The process of loading the trucks involves an average cost of 5.5 cents per 100 pounds of fruit handled. In the three plants this item varied from 2.7 to 6.6 cents per hundred. In terms of man minutes required, the average was 3.3 and the range was from 1.8 to 4.1 per 100 pounds of fruit loaded. If storage facilities were large enough to accommodate a fork truck, it would be possible to reduce this cost and, to some extent, packing costs as well, by using pallets in moving fruit both into and out of the storage area.

*Packing Materials.* For most commercial shipments, all three packing plants were using a fiberboard carton in which 10 pounds net of papayas are packed. Packing materials other than the box itself consist of shredded paper or excelsior, tissue wraps, gummed paper for sealing, staples for the carton, and, in two plants, decals for the fruits. Despite this uniformity in containers and other materials used, there was still a marked variation in the cost per 100 pounds of fruit packed. The range was from \$2.07 to \$3.16, with the average at \$2.63 per hundred. Converted to a per-box basis, this average represents a cost of 26.3 cents for each 10 pounds of fruit packed, or 2.63 cents per pound. This one item is greater than all other direct costs combined. There is opportunity for these packers to realize a saving by pooling their orders for packing materials. The very considerable difference in prices paid for substantially uniform cartons and other materials used by the individual packers offers a likely prospect for reduction of packing costs in those cases where such costs are above the indicated minimum of \$2.07 per 100 pounds of papayas packed.

*Making Boxes.* Labor costs involved in assembling papaya cartons were found to vary greatly from one plant to another, and even from one day to another in the same plant. A range of 14.0 to 41.2 cents in this item is difficult to justify, particularly when it is known that the job is substantially the same in all three locations. The average cost during the survey period was 21.5 cents per 100 pounds of fruit packed, or the equivalent of 2.15 cents for each carton assembled. This operation usually includes stapling of the carton, partial filling of each box with shredded paper or excelsior, stacking of the containers, and moving the assembled boxes into the packing room. There is ample opportunity to reduce the cost of making boxes by eliminating unnecessary handling of the assembled cartons, locating the box-making section in close proximity to the packing room, and using a power stapling machine wherever volume of fruit handled will justify the outlay for such equipment.

In terms of total packing cost for papayas, the maximum range for the three

plants observed was from \$3.74 to \$6.36 per 100 pounds of fruit packed. This variation reflects the extreme difference possible, as the range for each function or expense represents the minimum and maximum cost attributed to that classification in the three plants studied. The average cost of packing, including assembly and materials, in the three plants was \$4.83 per hundred, or \$0.483 per regular 10-pound carton. In terms of plant labor requirements in the packing of papayas, the range in total time expended was from 69.1 to 114.6 man minutes per 100 pounds of fruit packed. The average time required was 93.0 man minutes per hundred, or 9.3 minutes per carton containing 10 pounds of papayas. Only that labor related directly to the handling of the fruit from the time it is received at the packing plant until it is loaded out in packed boxes is included in this measurement of labor requirements. Within rather broad limits in size of lot, no significant relationship was noted between the volume of papayas packed at a given time and the labor cost per unit handled. This situation is not entirely unexpected, however, as the packing of fresh papayas is basically a hand operation.

## PINEAPPLES

### DIRECT COSTS AND LABOR REQUIREMENTS

During the period of January–May 1953 there were five shippers in Hawaii who were making regular deliveries of fresh pineapples to mainland markets. Three of these firms used substantially identical processes in handling the fruit. In the other two cases, however, there were more or less important deviations from the usual pattern. One of the latter shippers packs in the pineapple fields instead of in a permanent shed such as that used by the other four. Another who has no fumigation facilities at his packing plant is using a Territorial chamber for this purpose. The shipper who packs in the field has developed portable fumigation chambers in which the packed crates are treated and then hauled to the docks. In three cases the raw fruit is purchased at the end of rows in the fields, whereas the other two packers actually pick the fruit from the pineapple plants. Despite

Table 5. Direct costs and labor requirements of packing pineapples shipped from Hawaii in the fresh form, in cents and man minutes per 100 pounds of fruit packed, January–May 1953.

	Cents		Man minutes	
	Range	Average	Range	Average
Assembly* .....	31.4– 56.2	44.5	—	—
Receiving, and loading fumigation chamber .....	1.9– 6.7	3.7	1.3– 4.1	2.1
Unloading chamber, packing and storing .....	20.8– 48.4	30.4	14.0–28.8	17.8
Loading out .....	2.3– 6.1	4.2	1.4– 3.6	2.3
Packing materials .....	141.0–260.7	165.9	—	—
Making boxes .....	4.9– 16.5	11.9	—	—
All plants .....	202.3–394.6	260.6	16.7–36.5	22.2†

\* Includes picking, loading, and transporting fruit from field to packing plant.

† Represents direct labor required in packing plant operations only.

these differences in operating methods, it is still possible to break down the operations of each packer into a uniform pattern of basic functions or expenses. It is this classification of functions or expenses contained in table 5 that serves as the basis for the discussion of pineapple packing costs that follows.

*Assembly.* Pineapples packed for shipment in the fresh form are usually purchased from the large plantations operating in Hawaii. The most common arrangement is to take delivery of the fruit after it has been picked and brought to the end of the rows in the field. Where this method of purchase is not used, the practice is for the buyer to remove the fruits directly from the plants. Except in the case of the one shipper who packs on trucks in the fields, the pineapples are placed in field lugs, or loaded loose, and transported by truck to the packing shed. The cost of picking, loading, and hauling pineapples ranged from 31.4 to 56.2 cents per 100 pounds of fruit packed. As would be expected, the firms incurring the higher costs at this level were those that actually picked the pineapples from the individual plants in the fields. This apparent disadvantage is not significant, however, since the price differential between pineapples on the plants and those at the end of rows offsets the difference. For all five shippers the average cost of performing this function was 44.5 cents per hundred.

*Receiving, and Loading Fumigation Chamber.* Depending upon the packing method used, the pineapples are placed in the fumigation chamber either before packing or after they are in the shipping containers. Where fiberboard cartons are used, the containers are sealed when packed, so the fruit must be fumigated before being placed in the box. Fumigation may be performed after packing if open-slat crates are the shipping medium. The cost of performing this operation varied considerably from plant to plant, and the range was from 1.9 to 6.7 cents per 100 pounds of pineapples packed. The average for all five shippers was 3.7 cents per hundred. From 1.3 to 4.1 man minutes per 100 pounds handled were required to receive the pineapples and load them in the fumigation chamber. The average time requirement for performance of this job was 2.1 man minutes per hundred. Better plant arrangement and greater use of mechanical conveyors would offer possibilities of cost reduction at this stage of the packing process.

*Unloading Chamber, Packing and Storing.* In packing pineapples for fresh shipment, the major operation is the actual placing of the fruits in the shipping containers. After the boxes are packed they must usually be stored for a varying period of time, ordinarily less than 48 hours, until they can be taken to the docks to be loaded aboard a steamship. Storage space may be a cold room, an open space within the plant, or the fumigation chamber. Cost of labor involved in this series of activities was from 20.8 to 48.4 cents per 100 pounds of fruit packed. The average cost was 30.4 cents per hundred, which is equivalent to about two thirds of the assembly cost for pineapples. It took from 14.0 to 28.8 man minutes per 100 pounds of pineapples packed to perform this job, and the average for all plants surveyed was 17.8 man minutes.

Equipment used in packing fresh pineapples for export is a minor item. The most elaborate arrangement used by any of the five shippers consisted only of a double line of roll conveyors and individual stands for about eight packers. Two



packing plants employ only a single roll conveyor and a fairly large table for packing pineapples, and the other two shippers have no packing equipment at all. The latter simply place fruit in the containers on the floor of a packing shed or truck. Special packing equipment that would permit semimechanical packing of pineapples could be designed without serious difficulty. In contrast to papayas, pineapples would absorb the type of shock and handling that is found in practically all mechanical packing lines. The economic feasibility of such an installation would depend upon initial cost and volume of fruit to be packed. As has been mentioned in the section dealing with papayas, there is need for improvement of plant arrangement so the packing will be closer to a straight-line operation in which unnecessary handling of the fruit can be eliminated.

At least four distinctly different types of containers are now used in packing pineapples for shipment to the Mainland. The type of container used by a shipper has a strong influence upon the cost of packing this particular fruit. Those boxes that lend themselves to dropping each fruit into an individual space or compartment are generally more economical to pack than are the other types of containers that require the placing of each fruit by the person engaged in packing. The possibility of effecting a saving in packing cost through adoption of an improved type of container or redesigning of existing containers is worthy of investigation by the pineapple shippers of Hawaii.

*Loading Out.* Fresh pineapples for export are practically always shipped within a period of 48 hours after they have been packed. The cartons of pineapples are moved by truck from the point where they are fumigated or stored to the local docks for shipment in refrigerated space aboard a steamship. The loading out of pineapples is the last of the functions generally considered as a packing operation. Loading out ranged in cost from 2.3 to 6.1 cents per 100 pounds of fruit handled by the five packers surveyed. The average outlay for this step was 4.2 cents. Average time required for loading out was 2.3 man minutes per 100 pounds, and the range in this labor requirement was from 1.4 to 3.6 man minutes. The comment above on the possibility of mechanizing the handling of packed papayas would apply equally to pineapples. The potential saving through mechanical handling of pineapples would be more practicable of immediate accomplishment because of the larger volume of this fruit now being packed.

*Packing Materials.* In shipping fresh pineapples to the Mainland, each of the five packers was using a special container that was different from all others in size, shape, or material. Including the various sizes of packages in regular use, there are at least 10 different containers that are employed for commercial shipment of fresh pineapples from Hawaii to the Mainland. Other packing materials in regular use include excelsior, corrugated cardboard wraps, staples and gummed tape for fiberboard cartons, nails for crates, and collars or tags for indicating origin of fruit and trade name of the packer. Partly as a result of the wide variation in containers used by the various packers, the cost of packing materials ranged from \$1.41 to \$2.61 per 100 pounds of fruit shipped. The average cost was reasonably near the lower end of the scale, however, and was found to be \$1.66 per hundred. This would indicate that the packers are tending to use the

type of container that involves the lower unit costs. Further progress in this direction is possible. There is a real need for standardization of pineapple containers which would serve not only as a readily available method of reducing costs but also as a means of clarifying the quoting of pineapple prices in the wholesale markets.

*Making Boxes.* Containers now being used in the shipment of fresh pineapples from Hawaii are all received in the unassembled form from mainland manufacturers. The process of making up these boxes, preparing them for packing, and placing the empty containers in proper position for use by the packers requires a sizable outlay in plant labor. Cost of this operation ranges from 4.9 to 16.5 cents per 100 pounds of fresh pineapples packed. Average cost for the five shippers was 11.9 cents. Use of improved equipment and better location of the box-making section in relation to the packing room would contribute to greater efficiency in the performance of this job.

A wide range was found in the total direct costs of packing fresh pineapples for shipment from Hawaii to the Mainland. The maximum for the combined functions or expenses was \$3.95 per 100 pounds of fruit packed. In contrast, the minimum was only \$2.02. In examining the range in over-all costs, it should be noted that these totals reflect the extremes for each operation or expense in all five plants. For this reason they are not to be considered as the representative totals for the high-cost plant and low-cost plant, as the relative position of the five units varied from one classification to another. Average direct costs of the five packers were found to be \$2.61 per 100 pounds of pineapples shipped. Labor requirements in packing operations varied from a low of 16.7 man minutes per 100 pounds to a high of 36.5 man minutes. Average labor utilized in packing 100 pounds of fresh pineapples totaled 22.2 man minutes. Only that labor involved directly in the handling of the fruit during the packing process is included in these totals of time expended. In general, the same observation concerning the limited relationship between size of lot and labor cost per unit packed may be made for pineapples as was reported above in the section on the cost of packing fresh papayas. At the present time the packing of fresh pineapples involves the same type of hand operations as is required in preparing papayas for shipment to mainland markets.

### **DISTRIBUTION OF CONSUMER DOLLAR**

A major objective of this project has been the allocation of the consumer dollar used for purchase of fresh Hawaiian papayas and pineapples. This breakdown of the retail dollar is designed to show the share of the end price that is taken at each of the various marketing levels involved between the producer and consumer. In determining the relative shares taken at the several marketing levels, figures for March 1953 have been used as the basis for the allocation contained in table 6. This particular month was selected because it coincides with the periods during which retail and wholesale margins, transportation charges, and assembly and packing costs were being measured as segments of the entire project. The breakdown indicated by table 6 is applicable to papayas and pineapples

# THE CONSUMER'S DOLLAR

Where It Goes

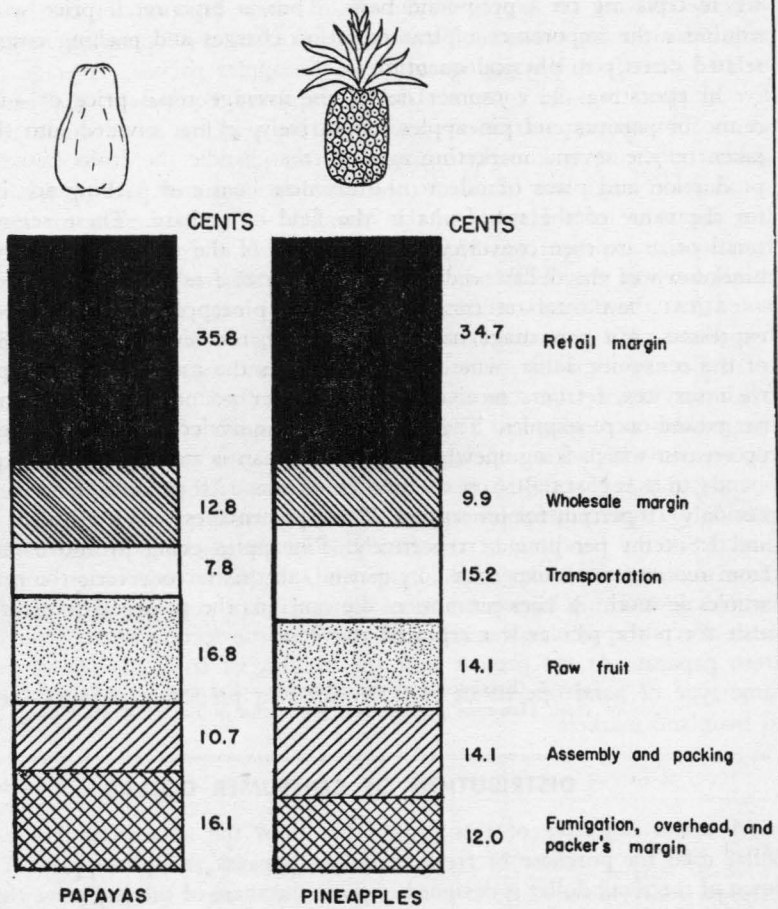


Chart 1. Breakdown of the consumer dollar used to purchase fresh Hawaiian papayas and pineapples, Pacific Coast cities, March 1953.

marketed on the Pacific Coast, where the Los Angeles and San Francisco areas alone account for over 90 percent of the papayas and pineapples shipped from Hawaii in the fresh form. March 1953 was a satisfactory month for fresh pineapples, as far as being representative of the normal movement to market is concerned. In the case of papayas, however, export shipments were unusually low in March, and the market prices were therefore higher than had been expected by the trade. The relatively high retail price for papayas tends to distort the allocation of the consumer dollar to the several marketing levels, particularly at those points where costs are on a per-pound basis. Thus, a high retail price would tend to minimize the importance of transportation charges and packing costs, which are related directly to physical quantity.

In allocating the consumer dollar, the average retail price of 44.7 and 18.4 cents for papayas and pineapples, respectively, is first divided into the segments taken by the several marketing agencies that handle the fruits between point of production and place of sale to the ultimate consumer. Allowance is also made for the value of the raw fruits in the field or orchard. These segments of the retail price are then converted to percentages of the total, and thus represent the breakdown of the dollar used in the purchase of fresh papayas and pineapples.

RETAIL MARGINS on fresh papayas and pineapples were about equal when expressed on a percentage basis. On papayas, retailers were taking 35.8 percent of the consumer dollar, whereas on pineapples the margin was 34.7 percent. For their services, retailers received 16.0 cents per pound on papayas and 6.4 cents per pound on pineapples. These margins are equivalent to about 55 percent mark-up on cost which is a somewhat higher rate than is realized on staple produce.

WHOLESALE MARGIN on the two fruits was 12.8 percent of retail for papayas but only 9.9 percent for pineapples. These percentages were equivalent to 5.7 cents and 1.8 cents per pound, respectively. Pineapples generally move more directly from receiver to retailer than do papayas, and this factor affects the margin at the wholesale level. A sales promotion allowance to the principal receiver of papayas also affects the wholesale margin on that fruit.

Table 6. Breakdown of the consumer dollar used for purchase of fresh Hawaiian papayas and pineapples in Pacific Coast cities, March 1953.\*

Margin or cost	Papayas		Pineapples	
	<i>cents/lb.</i>	<i>percent</i>	<i>cents/lb.</i>	<i>percent</i>
Retail margin .....	16.0	35.8	6.4	34.7
Wholesale margin† .....	5.7	12.8	1.8	9.9
Transportation charges .....	3.5	7.8	2.8	15.2
Assembly and packing costs .....	4.8	10.7	2.6	14.1
Raw fruit‡ .....	7.5	16.8	2.6	14.1
Residual for fumigation, overhead, and packer's margin....	7.2	16.1	2.2	12.0
Total .....	44.7**	100.0	18.4**	100.0

\* Based for the most part upon data contained in tables 1, 3, 4, and 5.

† Includes sales promotion on papayas only.

‡ Value f.o.b. field or orchard.

\*\* Average retail price.



TRANSPORTATION CHARGES are proportionately greater for pineapples than for papayas because of the difference in unit value. This marketing cost absorbed 7.8 percent of the retail price of papayas, whereas on pineapples it took 15.2 percent of the consumer dollar. For reasons explained in the section above on transportation, the per-pound cost of moving papayas to market was greater than the same expense item on pineapples. On this basis the charges were 3.5 cents per pound for papayas and 2.8 cents for pineapples.

ASSEMBLY AND PACKING COSTS do not make up as large a part of the total marketing expenses as is usually assumed. In fact, these direct costs incurred by the shippers were found to be equal to only 10.7 percent and 14.1 percent of the average retail price of papayas and pineapples, respectively. In monetary cost the expenses allocated to the function of assembly and packing averaged 4.8 cents per pound for papayas and 2.6 cents for pineapples. These costs were thus equivalent to some 30 to 40 percent of the margin taken by retailers alone and were not too far out of line with transportation charges paid in moving these fruits from Hawai'i to mainland markets.

RAW FRUIT used in packing fresh papayas and pineapples for mainland markets is a major element of cost to local shippers. During March 1953 the return to growers for pineapples packed for export averaged about 2.6 cents per pound in the fields. For papayas the average price paid was approximately 7.5 cents per pound. The assignment of values to these fruits is complicated by the differing methods of purchase, e.g., pineapples on the plants or at the end of the row, and by the fact that certain papaya shippers produced all or part of the fruit that they packed. Cost or value of the raw fruit made up 16.8 percent of the retail price paid for fresh papayas in the mainland markets surveyed. In the case of pineapples this percentage was 14.1, which indicates clearly that the value of the fruit itself at point of production constitutes only a relatively minor part of the price paid by the ultimate consumer.

RESIDUAL FOR FUMIGATION, OVERHEAD, AND PACKERS' MARGIN represents the net amount realized by the shipper after the readily measurable margins and costs listed above have been deducted from the average retail prices of fresh papayas and pineapples sold in Pacific Coast markets. This net realization remaining after the specified margins or costs have been covered is roughly equal to the value of the raw fruit. It amounted to 7.2 cents per pound for papayas shipped in March, but on pineapples it was only 2.2 cents per pound. The residual represented 16.1 percent of retail on papayas and 12.0 percent on pineapples.

Because of differences in the fumigation methods employed by the various packers, it did not prove practicable to measure the cost of this process as a separate item. For much the same reason no effort was made to determine unit costs of overhead in the several packing operations. To illustrate the difficulties involved in setting up a detailed analysis of costs at this point, it was found that different methods used in treating the fruit included a gas chamber for fumigation, a combination of hot water and gas chamber, and a vapor heat treatment; in one case, fumigation was performed on a fee basis in a Territorial chamber. Furthermore, at least half the shippers who pack fresh papayas and pineapples

for export are also engaged in other lines of business which complicates seriously the allocation of overhead costs. These obstacles could be overcome to some degree through an extended and detailed study of each shipper's business, but this type of investigation was not contemplated in this project, nor was time available to undertake such research.

It is at this last point in the scale of margins or costs that immediate absorption must come if market prices of fresh papayas or pineapples decline on the Mainland. If prices fall rapidly and to any marked extent, as indeed they did in May 1953, the continuation of the fixed costs, such as transportation, assembly and packing, and, to a lesser extent, retail and wholesale margins and cost of raw fruit, at about the same level as before has the effect of concentrating the full force of the decline in placing a squeeze on the residual from which the shipper must realize his profit. Therefore, what may appear at any given time to have been an adequate percentage allowance for the items included in the residual can easily prove to be insufficient to cover even fumigation and overhead expense when prices drop rapidly. Conversely, of course, the margin of the shipper is broadened by short-term, upward movements of the market.

### **MARKET CHARACTERISTICS**

As far as papayas and pineapples shipped to the Mainland in the fresh form are concerned, Hawaii has always sold practically all such export shipments in the Pacific Coast markets. As has been emphasized above, California alone has been receiving over 90 percent of these fruits since shipments were resumed in volume after 1949. Small quantities of the fruits are distributed in other states by initial receivers in the Los Angeles and San Francisco areas, but the great bulk of the fresh papayas and pineapples from Hawaii are consumed in and around the two major California markets. Outside of California the only markets receiving a significant volume of these Hawaiian fruits are Portland, Seattle, and Vancouver. A few scattered commercial shipments have been sent directly to points farther east, but they are relatively unimportant except as an indication that there may be possibilities of developing markets other than those on the Pacific Coast.

Gift packages of fresh papayas and pineapples are shipped regularly to all parts of the United States, but this type of business is at the present time strictly a side line to the packing of commercial shipments. It is suggested that the industry may be well rewarded by devoting more attention to the development of direct mail selling.

On the basis of reports issued by the U. S. Bureau of the Census, it appears that shipments of fresh pineapples from Hawaii had reached a maximum annual volume exceeding 5,000,000 pounds during the years immediately prior to World War II. At the same time papaya shipments reached a high point of over 325,000 pounds in 1941. From 1950 to 1952, shipments of fresh pineapples from Hawaii have almost doubled each year, and in 1952 they totaled 2,577,000 pounds. At the same time, exports of papayas have gained steadily from 28,000 pounds in 1949 to 384,000 pounds in 1952. It was not until 1952, however, that the export trade in fresh papayas exceeded the volume reported for 1941. Despite the very rapid

Table 7. Receipts and average wholesale prices  
of fresh Hawaiian papayas and pineapples, Los Angeles and San Francisco,  
January 1951 through April 1953.

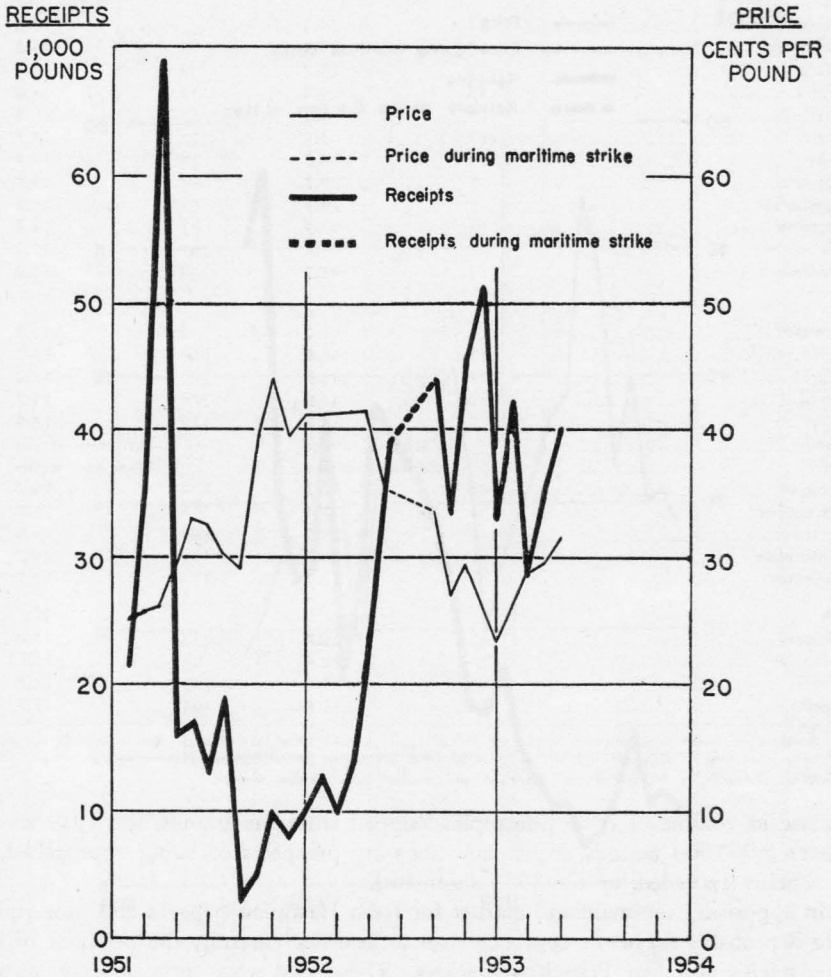
	Papayas		Pineapples	
	Net receipts*	Average price	Net receipts*	Average price
	1,000 lbs.	cents/lb.	1,000 lbs.	cents/lb.
1951				
January .....	21	24.8	60	13.6
February .....	35	25.5	74	14.2
March .....	69	25.7	60	14.0
April .....	16	29.4	117	16.0
May .....	17	33.0	67	14.6
June .....	13	32.5	37	17.7
July .....	19	30.2	29	18.8
August .....	3	29.2	62	15.7
September .....	5	39.4	63	15.3
October .....	10	43.9	83	14.4
November .....	8	39.4	107	13.8
December .....	10	41.2	160	13.1
1952				
January .....	13	41.2	132	11.9
February .....	10	41.6	139	14.3
March .....	14	41.9	222	16.2
April .....	24	41.9	279	15.7
May .....	39	36.2	310	15.9
June .....		Maritime strike		Maritime strike
July .....		Maritime strike		Maritime strike
August .....	44	34.2	374	14.2
September .....	34	27.4	233	11.8
October .....	46	29.3	160	14.0
November .....	51	26.3	365	14.9
December .....	33	22.8	249	13.5
1953				
January .....	42	25.7	238	13.0
February .....	29	28.4	304	13.1
March .....	35	29.6	561	12.2
April .....	40	31.4	503	11.7

\* Receipts are based upon the net weight of packed fruit shipped from Hawaii each month and do not reflect the overlap in months of shipment and arrival resulting from the transit period between Hawaii and the Pacific Coast.  
Source: Records of transportation companies and market news service reports.

increase in volume of fresh pineapples shipped from the Islands, the 1939 record of over 5,000,000 pounds is just now showing prospects of being approached, if not actually exceeded, by the 1953 shipments.

In appraising the mainland market for fresh Hawaiian papayas and pineapples, there is probably no better approach than to examine carefully the behavior of the Los Angeles and San Francisco markets. These two areas now receive such a large part of the exports of fresh Hawaiian fruits that the supply and demand situation in those markets actually controls the decisions of the papaya and pineapple packers in Hawaii. Table 7 provides a record of net receipts and average wholesale prices of fresh Hawaiian papayas and pineapples in Los Angeles and San Francisco during the period from January 1951 through April 1953.

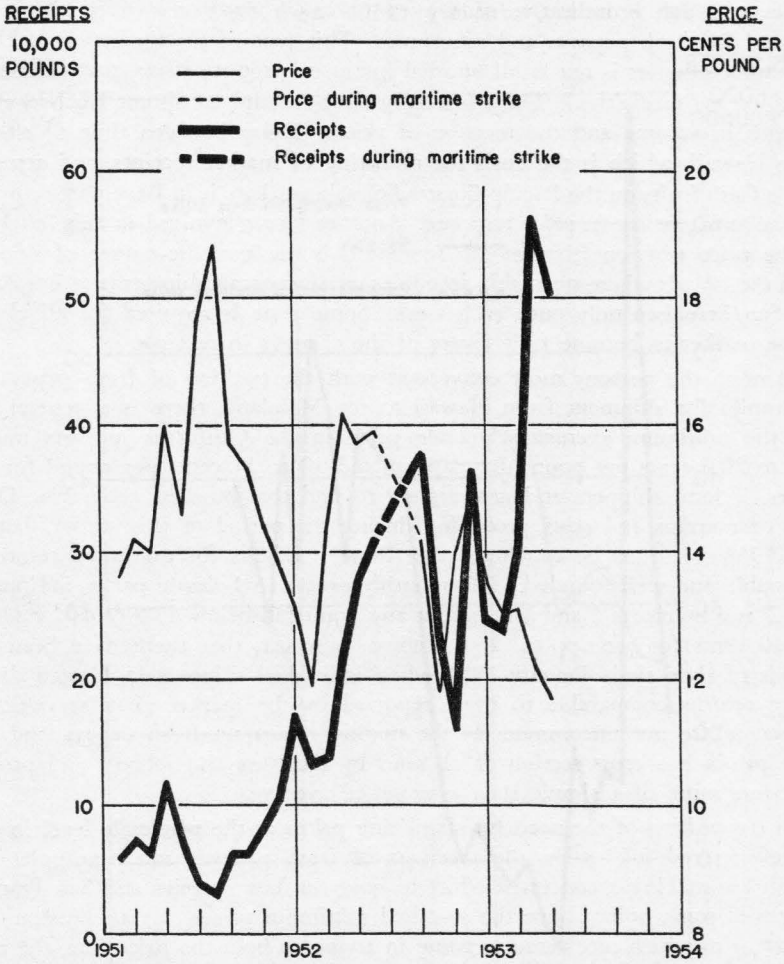
Chart 2. Monthly net receipts and average wholesale prices of fresh Hawaiian papayas, Los Angeles and San Francisco, January 1951 - April 1953.



Source: Records of transportation companies and market news service reports.



Chart 3. Monthly net receipts and average wholesale prices of fresh Hawaiian pineapples, Los Angeles and San Francisco, January 1951 - April 1953.



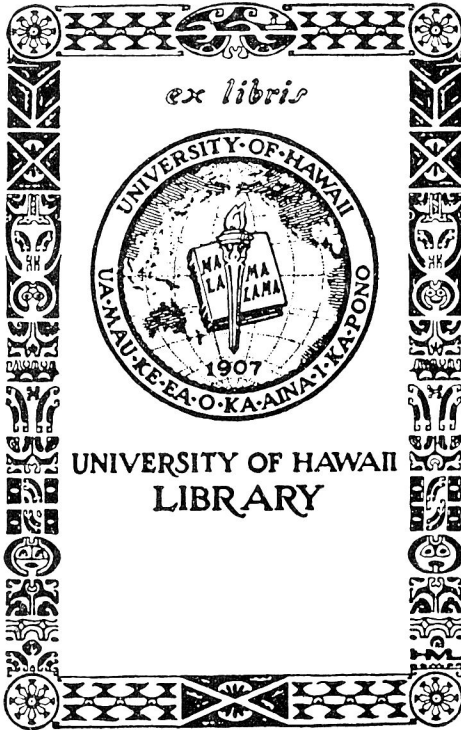
Source: Records of transportation companies and market news service reports.

In charts 2 and 3 the supply-price relationships based upon the data from table 7 are shown more clearly. It is evident from even casual examination of these charts that there is a high degree of relationship between volume and price in these markets, and that over a period of time the price curve generally moves in a direction opposite to that of the volume line. Price changes in response to variation in market receipts are relatively less than the fluctuations in volume, however, which is indicative of a more or less high degree of elasticity in the demand for fresh papayas and pineapples. This type of price reaction to changes in market supplies is not at all unusual for many produce items, particularly those classified as "specialties." There is a very clear-cut and consistent lag between the changes in volume and the reaction of prices. Delay between time of shipment from Hawaii, which is the basis for reporting of market receipts, and actual sale of the fresh fruits on the Pacific Coast wholesale markets is in large part responsible for the apparent lag in price response. Another factor involved in this "stickiness" of the price reaction from month to month is the sporadic nature of shipments from the Islands where steamship schedules usually permit shipments to Los Angeles and San Francisco only once each week. Some time is required for all elements of the market to become fully aware of the changes in receipts.

Among the persons most conversant with the packing of fresh papayas and pineapples for shipment from Hawaii to the Mainland, there is a general belief that the minimum average wholesale price in the California markets must be 17.5 to 20.0 cents per pound for papayas and 10 to 11 cents per pound for pineapples, if local shippers and growers are to find this business profitable. On the basis of margins and costs prevailing during the period of this study (January-May 1953), it must be concluded that these standards for minimum returns are reasonable and well founded. The monthly average wholesale prices indicated by table 7 and by charts 2 and 3 do not at any point fall below 17.5 cents for papayas and 10 cents for pineapples. It is known, however, that there have been short periods of time since January 1951 when individual shippers in Hawaii did not realize returns comparable to those reported by the market news service. Such differences are not uncommon, as the market report on fresh papaya and pineapple prices is a cross section of all sales by receivers and jobbers and probably represents more of a simple than a weighted average.

In recognition of the need for stabilizing prices at the wholesale level in order to prevent "red ink" sales, the receivers of fresh papayas and pineapples from Hawaii are making a concerted effort to hold the Los Angeles and San Francisco markets at some point above the so-called minimum prices. As an illustration of the extent to which receivers are going in trying to hold the price line, the major mainland distributor of fresh papayas establishes an informal quota system to be adhered to by the local shippers whenever shipments reach the point of forcing market prices below the break-even point. Such a quota is in effect at the present time (June 1953) because of heavy production of papayas in the Islands and increasing competition on the Mainland as shipments of melons and deciduous fruits arrive in volume. Some such informal control arrangement is probably justified and necessary as long as the markets will absorb the available supply of

fresh papayas and pineapples only at prices that will result in a loss to local shippers and growers. The obvious need in the marketing of both papayas and pineapples in the fresh form is expansion of the effective demand for such fruits through increased efforts in promotion of sales and development of a broader market. In line with the suggestions of people in the trade, it is essential that quality of these products be maintained and even improved and that the price during periods of short supply be kept within reason so that consumers will not develop resistance once they start using fresh papayas and pineapples. Shippers and growers alike should explore the possibilities of gearing production and export shipments to the seasonal pattern of competing fruits on the Mainland. In view of the competitive situation, it is reasonable to expect that many more papayas and pineapples can be sold in the fresh form on the Mainland during the period from October through April than can be moved profitably in the warmer months from May to September, when competing produce is on the markets in quantity.





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