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Cooperative Procurement of **CONTAINERS** for **FRUIT** and **VEGETABLE** **PROCESSING**

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FARMER COOPERATIVE SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

FARMER COOPERATIVE SERVICE
U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

Farmer Cooperative Service conducts research; advises directly with cooperative leaders and others; promotes cooperative organization and development through other Federal and State agencies; and publishes results of its research, issues News for Farmer Cooperatives, and other education material.

This work is aimed (1) to help farmers get better prices for their products and reduce operating expenses, (2) to help rural and small-town residents use cooperatives to develop rural resources, (3) to help these cooperatives expand their services and operate more efficiently, and (4) to help all Americans understand the work of these cooperatives.

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This study was made under contract by AgriResearch, Inc., Manhattan, Kans. Dr. Raymond J. Seltzer and Donald J. Wissman did most of the fieldwork and prepared a detailed report of findings.

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Highlights

Definite possibilities exist for cooperative processors of fruits and vegetables to procure their containers and other packaging supplies on a cooperative basis. Potential savings appear to be greater for cooperative manufacture than for cooperative purchase of the principal types of containers.

Savings of 14 to 17 percent appear to be possible from manufacturing metal cans if a substantial volume--12 million or more of the commonly-used large sizes and 50 million or more of the smaller sizes--can be produced annually. Savings of 5 to 10 percent often were possible from volume discounts, brokerage allowances, or negotiated prices for consolidated purchases. Perhaps a savings of 5 percent might be made in the fabrication and printing of paperboard shipping containers.

Cooperatives with container purchases of \$1 million or more a year appeared to be able to bargain more effectively with manufacturers than cooperatives with smaller purchases. This indicates many small processors might effect worthwhile savings by pooling their container purchases on a cooperative basis.

Information from 76 cooperative processors contacted in 1965 indicated that containers and packing supplies were the largest single cost item, exclusive of the fruits or vegetables. Purchases averaged \$1.9 million per association; represented 36 percent of total processing costs; and were equal to 22 percent of the sales value of processed products.

Estimates indicated that all cooperative processors annually purchase about \$160

million worth of containers and other supplies for packing some \$725 million worth of fruits and vegetables they market. Thus, if savings of 5 to 10 percent on purchases could be made through cooperative procurement, the total potential savings for grower members would be from \$8 million to \$16 million a year.

Metal cans accounted for 68 percent of the expenditures for containers; corrugated cardboard cases (including cannery cases) for 19 percent; glass containers represented 7 percent; and other items amounted to 6 percent of the total.

Cooperatives bought 92 percent of their containers directly from manufacturers. Service and price were the main reasons given. Processors relied on manufacturers to deliver containers on an "as needed" basis. The cooperatives' beginning and ending inventories of containers averaged 2.5 percent of annual purchases and peak stocks averaged 7.2 percent.

Various forms of quantity discounts, brokerage allowances, and warehouse allowances were available to half the reporting cooperatives. The most common quantity discount was 5 percent of purchases. Some reported discounts as high as 5 percent for volume, 5 percent for brokerage allowance, and 5 percent at year's end. The standard rate and terms for cash discounts were usually 1 percent within 10 days--net 30 days.

About 80 percent of the container items were transported directly from suppliers' plants in truckloads, 16 percent were carload lots, and 4 percent were smaller lots.

Prices paid to manufacturers for metal cans, cases, and glass items of the commonly used sizes varied considerably. The highest prices per thousand for seven types of metal cans ranged from 10 to 52 percent above the lowest prices paid. These variations reflected possible regional differences, and variations in freight costs, quantities purchased, and material specifications.

Forty percent of the cooperative processors contacted indicated possibilities for cooperative purchase of containers. They thought such efforts would be most beneficial in cases where cooperative processors are relatively small and lack individual buying power.

Over half of the processors interviewed however, believed that cooperative manufacture of containers was either a possibility or a definite opportunity. A few large processors were actively interested in the cooperative manufacture of metal cans, and to a limited extent in the fabrication of corrugated paperboard containers. Interest was greatest in areas where several large associations were processing a similar line of products packed in standard containers.

Questions about the feasibility of cooperative manufacture centered principally on having sufficient volume of one or several types of containers (as there are wide variations in size, weights, and finishes of containers) and meeting technological changes underway in the container industry, such as the trend toward use of lighter weight materials and containers with more consumer appeal.

Further cooperative procurement of containers appears feasible in California, which accounts for 36 percent of the total U.S. pack of processed fruits and vegetables. Can manufacturing by C. T. Supply Co., Fremont, Calif., and corrugated container fabrication by Fruit Growers Supply Co., Los Angeles, are examples of successful operations. Smaller associations should be able to conduct similar operations through federated associations, such as Consolidated Agricultural Industries at Los Angeles.

The Florida pack accounts for only about 8 percent of total U.S. processed fruits and vegetables, but virtually all canned citrus fruits and canned or frozen citrus juices. The Winter Garden (Fla.) Citrus Products Cooperative manufactures a substantial portion of the cans it uses. There appears to be substantial possibilities for the cooperative manufacture of metal or composition cans in the citrus area by a federated association such as Citrus Central, Inc., Winter Park, Fla.

In the Northwest, a wide variety of deciduous fruits and vegetables accounts for about 13 percent of the U.S. pack. Cooperative purchase of some items and manufacture of cans seem to have a few possibilities in the Portland, Oreg., area where a limited number of can types and sizes are used.

In the Northeast, opportunities for cooperative purchase of containers appear limited by the wide variety of products and dispersion of firms. A few of the large cooperatives, however, might advantageously manufacture cans or fabricate corrugated paperboard containers.

Cooperative Procurement of Containers for Fruit and Vegetable Processing

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Cooperatives engaged in processing fruits and vegetables use a wide variety of containers such as metal cans, glass bottles and jars, paperboard cartons, and plastic bags. Annual expenditures for these supplies are often one-third or more of total processing costs and equal to a fifth of the sales value of the products marketed.

Over 100 cooperatives do some type of processing of fruits and vegetables, with about 70 percent processing only fruit, 15 percent only vegetables, and another 15 percent both products. Estimates indicate that about 75 percent of cooperatives primarily marketing processed fruits have sales of less than \$5 million a year, and that over half of those processing vegetables have sales under \$1 million a year. Many cooperatives buy containers and other packaging supplies in small quantities--perhaps at a disadvantage relative to large packing firms.

Several local marketing associations in Florida, California, and Washington purchase paperboard containers and other packaging supplies through regional container-supply cooperatives. Two of these associations have fabricating arrangements with container companies and one manufactures wooden boxes. Another cooperative in the Northeast operates a bag manufacturing plant. Recently three cooperatives (two in California and one in Florida) acquired three plants that manufacture metal cans.

Reports indicate that these procurement activities are resulting in substantial savings to the cooperatives and their grower members. Most of the major canners of fruits and vegetables manufacture a part of their own container requirements.

A study of cooperative procurement programs and possibilities therefore was undertaken because of the interest of smaller cooperative processors in obtaining containers more advantageously.

Purpose, Scope, and Method of Study

The principal objectives of this project were to:

1. Analyze and evaluate the present system used by cooperative marketing associations for purchasing, manufacturing, and transporting containers and packaging materials for fruits and vegetables.

2. Determine methods by which savings can be made or services improved in procuring container and packaging supplies.

The study covered the United States, but major attention was focused on areas such as Florida, California, the Pacific Northwest, and a few Northeastern States where most

production and processing of fruits and vegetables are concentrated.

Data were obtained from mail questionnaires and personal interviews. A list of all cooperatives processing fruits and vegetables in the United States was developed by the Farmer Cooperative Service, and checked and updated by State cooperative councils, agricultural extension specialists, agricultural experiment station personnel, and others in the various States.

In 1966, interviews were conducted with personnel of 36 processing cooperatives selected from the most concentrated areas of fruit and vegetable production--California, Florida, Michigan, New York, Oregon, Pennsylvania, and Washington (fig. 1). Twenty-five of those interviewed processed only fruits, two processed only vegetables, and nine processed

both fruits and vegetables. They were representative as to type of operations but above average in size. In addition, conferences were held with container manufacturers and regional container-supply cooperatives.

Questionnaires were mailed to 130 other cooperatives reported to be processing fruits and vegetables. Replies were received from 91 cooperatives, or 70 percent of the total. However, only 40 questionnaires were usable (fig. 2). Of the 51 unusable replies, 37 indicated that they did not process fruits or vegetables in 1965, 8 were no longer in business, 6 did not purchase containers, and 3 did not provide any information.

Thus, findings in this study are based primarily on analysis of data provided by 76 cooperatives (36 through personal interviews and 40 through mail questionnaires).

Volume and Types of Products Processed

The processing of fruits and vegetables in the United States is carried on by a relatively large number of cooperatives and other firms. Because of the wide variety of products processed, types of processing done, and range in volume of sales, the operations of these processing firms vary considerably. However, certain structural patterns in the procurement and use of containers and packaging supplies are well defined.

Sales of Processed Fruits and Vegetables

Volume is reported in dollars of products sold rather than in physical measures because of the wide variety of fruits and vegetables processed and the different size and type of packs. Total sales reported by the 76 cooperative processors contacted in this study were about \$669 million for 1965. Annual sales of the cooperatives ranged from less than \$100,000 to approximately \$100 million, with

an average of \$8.8 million per cooperative. In addition, data submitted annually to Farmer Cooperative Service indicated about 39 other small cooperatives processed nearly \$55 million worth of fruits and vegetables that year. Thus, total sales of all cooperative processors (about 115) were about \$725 million in 1965.¹

Nearly half of the 76 cooperatives reported sales in the \$1.0 million to \$4.9 million range; however, this group accounted for only 14 percent of the total volume (table 1). Twenty percent of the processors reported sales of \$10 million or more, but they accounted for 77 percent of the reported volume. Overall, 73 percent of the cooperatives reported sales

¹ 56 cooperatives primarily processing fruits and vegetables reported sales to the National Commission on Food Marketing of \$618.4 million in 1964-65, an average of \$11,043,000 per association. See Organization and Competition in the Fruit and Vegetable Industry, National Commission on Food Marketing, Tech. Study No. 4, pp. 255-272, June 1966.

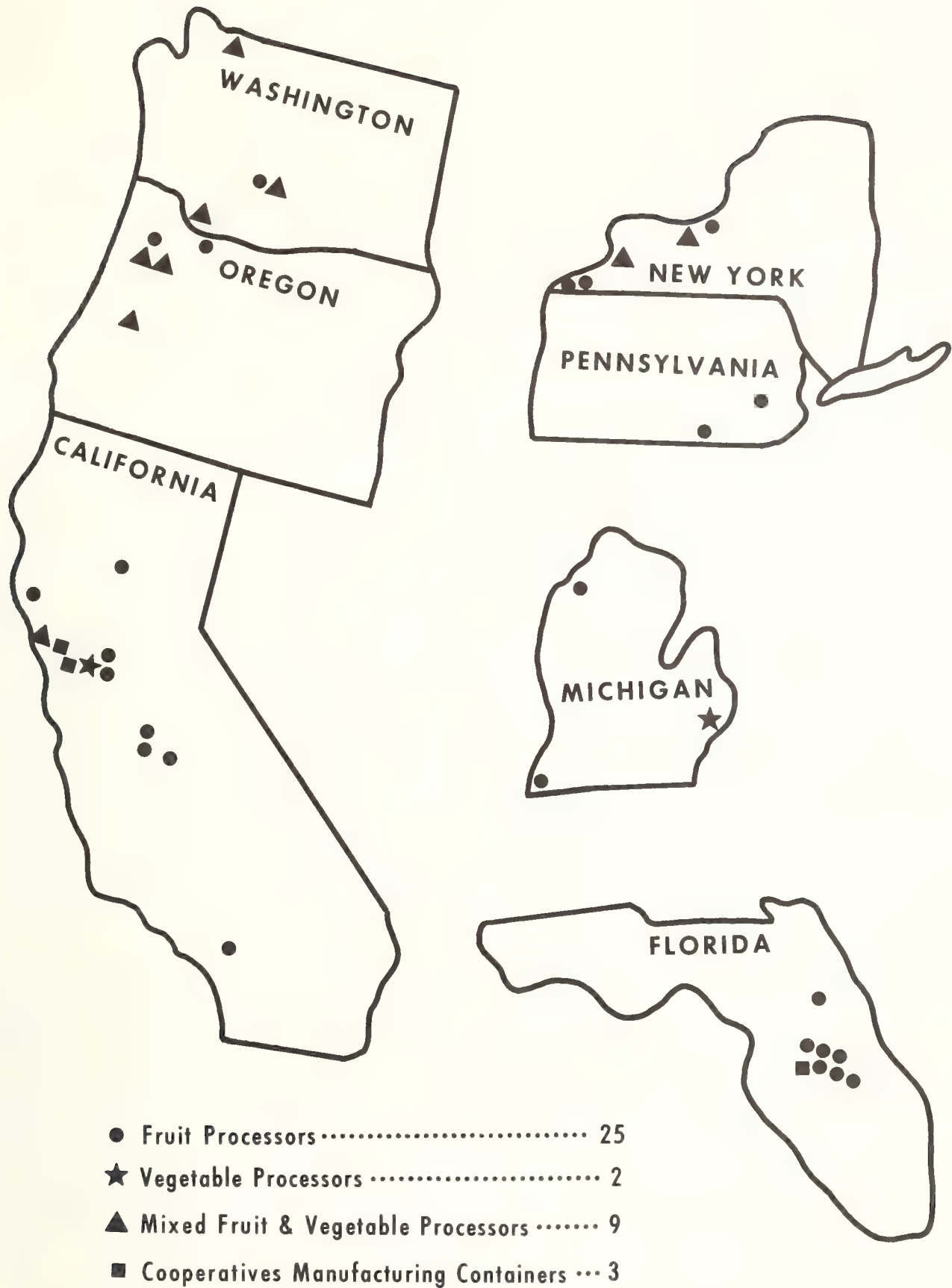


Fig. 1. Location of fruit and vegetable processing associations contacted by personal interview, 1965

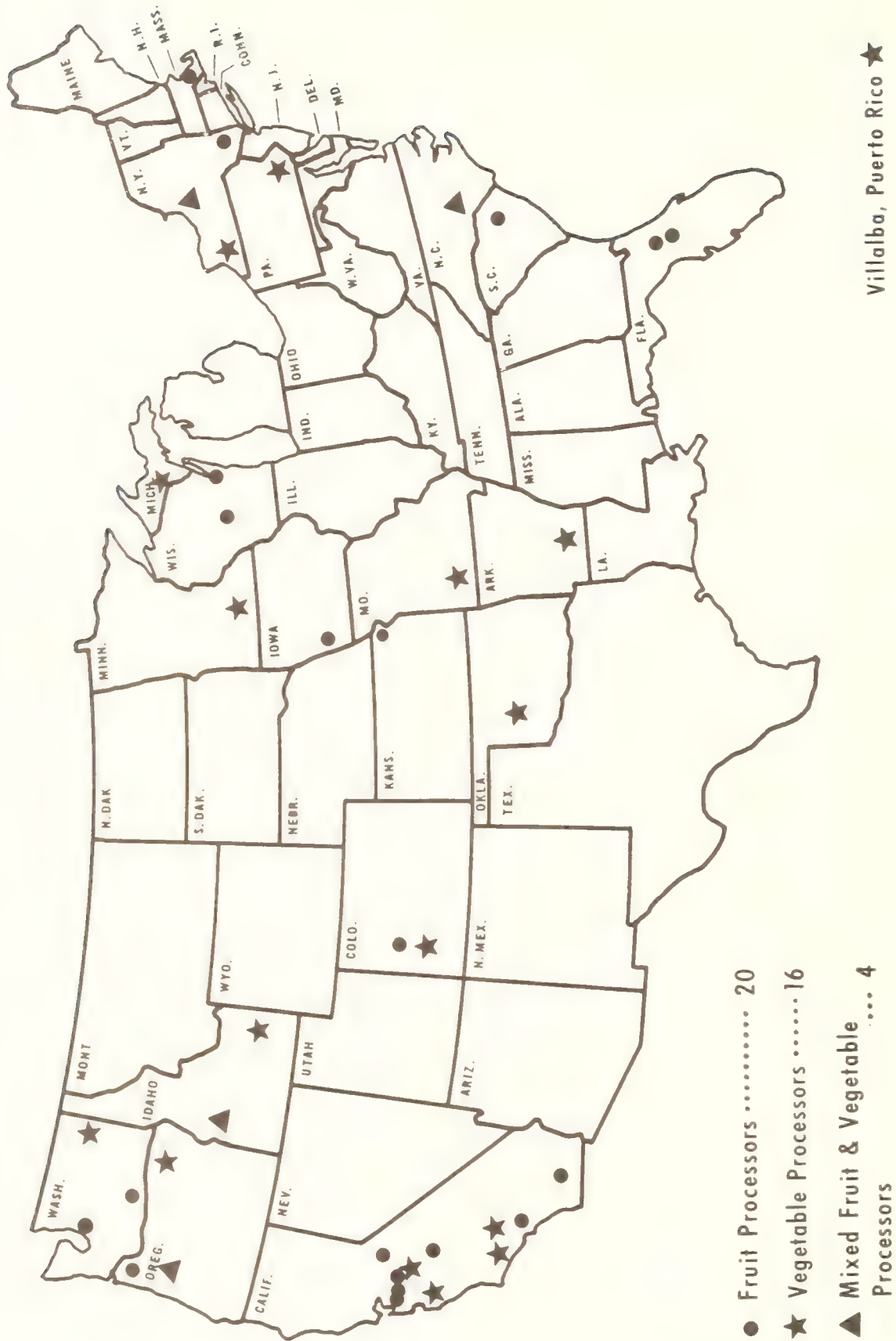


Fig. 2. Location of fruit and vegetable processing associations from which usable mail questionnaires were received, 1965

Table 1.--Range in sales among 76 fruit and vegetable processing cooperatives, by type of products processed, 1965

Sales	Fruits		Vegetables		Mixed		Total	
	No. of cooperatives	Pct.	No. of cooperatives	Pct.	No. of cooperatives	Pct.	No. of cooperatives	Pct.
Less than \$250,000	4	9	3	16	--	--	7	9
\$ 250,000 - \$ 499,999	4	9	3	17	--	--	7	9
\$ 500,000 - \$ 999,999	3	7	4	22	--	--	7	9
\$ 1,000,000 - \$4,999,999	22	49	5	28	7	54	34	45
\$ 5,000,000 - \$9,999,999	2	4	2	11	2	15	6	8
Over \$10 million	10	22	1	6	4	31	15	20
Total	45	100	18	100	13	100	76	100

of \$1.0 million or more and accounted for approximately 98 percent of the total sales of fruits and vegetables.

Of the 76 associations, 45 processed only fruits with sales totaling \$443.2 million; 18 processed only vegetables with sales of \$44.8 million; and 13 processed both fruits and vegetables with sales totaling \$183.5 million. Only part of the latter group reported sales data for each type of product.

Cooperatives processing only fruits were 59 percent of the total group and normally had greater sales than those processing only vegetables. Annual sales of 76 percent of the fruit processors were \$1.0 million or more, with 22 percent exceeding \$10 million. Average sales per fruit processor were approximately \$8 million.

Only 45 percent of the vegetable processors had sales of over \$1.0 million. Average sales per vegetable processor amounted to \$3.2 million.

Seventeen percent of the reporting cooperatives processed both fruits and vegetables. This group had the largest dollar volume of sales, with an average of \$14.1 million per processor. All of this group reported sales of \$1.0 million or more.

Types of Processing

Cooperatives reported processing activities ranging from canning fruits and vegetables

and preparing various types of juices to manufacturing citric acid extracts for industrial uses (table 2). Slightly over 70 percent reported some type of canning activity. Major vegetables processed included peas, corn, beans, carrots, beets, spinach, broccoli, cauliflower, peppers, mushrooms, and potatoes. Major fruits included pears, apples, peaches, cherries, strawberries, blackberries, blueberries, cranberries, prunes, plums, apricots, nectarines, oranges, lemons, grapefruit, olives, and figs.

Freezing, second in importance to canning, was carried out by 39 percent of the processors. This process normally included the major vegetables; fruits such as cherries, peaches, strawberries, and blueberries; and concentrated fruit juices such as grape, orange, and lemon.

Juicing, which included both single strength and concentrates, was carried out by 20 percent of the cooperatives. The most common

Table 2.--Number and percentage of fruit and vegetable processing cooperatives in survey performing specified types of processing, 1965

Type of processing	Number of cooperatives	Percent of total
Canning	54	71
Bottling	12	16
Drying	8	10
Freezing	30	39
Juicing	15	20
Other	25	33

single-strength juices were tomato, apple, grape, orange, lemon, and grapefruit. Concentrates included grape, orange, lemon, and grapefruit.

Bottling, performed by 16 percent of the cooperatives, was primarily used for cranberries, olives, applesauce, and pickles. Some wineries bottled their own wine, brandies, and champagne.

Drying operations were reported for raisins, currants, apples, and potatoes only, and involved 10 percent of the cooperatives.

Other activities carried out by 33 percent of the processors included some fresh packing, pickling, brining, and producing tomato crystals, bulk wine, and industrial products such as citric acid extracts.

Volume and Types of Containers Purchased

The actual dollar value of containers and packaging supplies purchased by individual cooperatives varied considerably. This can be attributed to the wide range in size of operations; type of processing; type and size of container used, such as tin, glass, or cardboard; and type of labels used.

cooperative for the 68 cooperatives reporting (table 3). In addition, cooperatives contacted through personal interview reported an average expenditure of \$76,000 for other packaging supplies, mostly labels.

Purchases in 1965

Sixty-eight of the 76 cooperatives reported total purchases of \$89.1 million in 1965 (table 3). These costs were equal to about 36 percent of these cooperatives' total processing costs (exclusive of products), and to 22 percent of the sales value of the products they marketed. By applying this 22 percent ratio of container costs to product sales to the other 8 cooperatives--most with large volumes--container purchases for these 8 associations were estimated at \$55 million, or \$6,875,000 per association. Thus, the 76 cooperatives in the study had total purchases of about \$144 million in 1965, or an average of \$1.9 million per organization.²

As expected, metal cans, accounting for 68 percent of the total expenditure, represented the largest share; the average purchase by the 40 cooperatives using metal cans was approximately \$1.5 million.

Paperboard boxes represented 19 percent of the total volume, with an average of about \$334,000 per cooperative. Purchases of glass containers represented only 7 percent of the total volume, and averaged \$390,000 per year per cooperative.

Purchases of containers ranged from less than \$5,000 to more than \$20 million, with an average of approximately \$1,340,000 per

Twenty-five percent of the reporting cooperatives purchased \$1 million or more of the various types of containers (table 4). Some cooperatives in this group reported purchases as high as \$20 million. These cooperatives were usually able to take advantage of their size in negotiating with manufacturers, obtaining quantity discounts, and demanding and receiving excellent service from their suppliers. Cooperatives in this group normally centralized their buying of containers for more than one processing plant.

² The estimated purchases of containers and packaging supplies by all 115 processing cooperatives in the United States was about \$160 million in 1965. This estimate is based on the assumption that their purchases were equal to about 22 percent of the \$725 million worth of products they sold that year.

Seventy-three percent of the cooperatives purchasing metal cans made annual purchases of \$100,000 or more, with 33 percent purchasing \$1 million or more.

Table 3.--Total value of containers purchased by 68 fruit and vegetable processing cooperatives, by type of container, 1965¹

Type of container	Purchases by cooperatives using each container		Average purchases per using cooperative ²	Cooperatives using each container	
	Amount	Percentage of total amount			
	<u>\$1,000</u>	<u>Percent</u>	<u>\$1,000</u>	<u>Number</u>	<u>Percent</u>
Metal cans.....	60,400	68	1,510	40	59
Glass.....	6,560	7	390	17	25
Paperboard boxes.....	17,040	19	334	51	75
Other.....	5,130	6	143	36	53
Total.....	89,130	100	1,340	68	100

¹ Exclusive of other packaging supplies such as wraps and labels.

² More than one type used by most associations.

Table 4.--Number and percentage distribution of 68 fruit and vegetable processing cooperatives reporting container purchases, by value and types of containers, 1965

Value of containers purchased	Type of container								Total purchases	
	Cans		Bottles		Paperboard boxes		Other containers			
	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹
Less than \$5,000.....	2	5	--	--	3	6	6	17	2	3
\$ 5,000 - \$ 9,999....	1	2	--	--	2	4	6	17	3	4
\$ 10,000 - \$ 23,999..	1	2	--	--	7	14	1	3	2	3
\$ 24,000 - \$ 49,999..	4	10	2	12	7	14	7	19	9	13
\$ 50,000 - \$ 99,999..	3	8	4	23	6	12	4	11	10	15
\$ 100,000 - \$499,999..	9	22	8	47	16	31	10	28	16	24
\$ 500,000 - \$999,999..	7	18	1	6	8	16	2	5	9	13
\$ 1,000,000 - over.....	13	32	2	12	2	4	0	0	17	25
Total.....	40	100	17	100	51	100	36	100	68	100

¹ Totals may not add to 100 due to rounding.

Glass purchases per cooperative ranged from \$24,000 to \$1,500,000. Forty-seven percent made annual purchases ranging from \$100,000 to \$499,999. Only two firms, or 12 percent, purchased more than \$1 million worth of glass bottles per year.

Purchases of paperboard boxes, including canning cases, master cartons, and bulk packs, ranged from less than \$5,000 to slightly over \$1 million. Slightly over 50 percent of the reporting cooperatives purchased \$100,000 worth or more of paperboard boxes.

Purchases of other containers, which included wooden boxes, steel drums, molded pulp trays, plastic bags, film and other poly stock, ranged from less than \$5,000 to \$999,999 per association.

Purchases of other packaging supplies, which normally included only labels, were reported separately only by those firms contacted by personal interview. These purchases ranged from about \$200 to \$300,000. The average purchase, \$76,000, was probably somewhat lower than the total cost for labels because buyers of the finished goods often supplied their own labels.

Relation to Total Processing Costs and to Sales

The purchase of containers and packaging supplies represented the largest single cost item in the processing of fruits and vegetables. Fifty percent of the firms interviewed reported that container and packaging supplies represented from 13 to 60 percent of their total processing cost or an average of 36 percent. Fifty-three percent of the firms reported container costs ranging from 30 to 39 percent of their total processing costs.

Total costs of container and packaging supplies represented approximately 22 percent of the total value of products sold by the fruit and vegetable processors contacted in the study.

A percentage distribution of all costs, including returns to the growers, was provided by a medium-size cooperative, processing both fruits and vegetables, with total sales of \$6 million (table 5). Metal cans and cases represented 16.7 percent of the total sales, or about 30 percent of total processing costs (total cost minus returns to the grower). With the addition of labels, freight, and warehousing, total costs of container and packaging supplies represented about 22 percent of the value of sales, or 35 percent of total processing costs.

Table 5.--Percentage distribution of all disbursements (including expenses and proceeds to growers for products) in processing fruits and vegetables by a medium-size processing cooperative, 1965

Item	Percent of total sales
Metal cans	15.8
Cases9
Labels, warehousing, and freight	5.5
General selling	4.8
Manufacturing cost	26.3
General overhead	6.7
Other raw products and field work	4.3
Subtotal	64.3
Returns to growers (products)	35.7
Total	100.0

Container Procurement Practices

Cooperative fruit and vegetable processors were questioned about sources of container purchases, inventory and storage practices, pricing and discounts, and transportation methods.

Sources of Containers

Ninety-six percent of the cooperatives contacted purchased 92 percent of their container requirements directly from manufacturers (table 6).

Eight percent of the processors made purchases from local private suppliers such as local jobbers, brokers, and retail suppliers. These purchases accounted for an estimated 5 percent of all container purchases.

Three cooperatives obtained containers from supply cooperatives; these purchases accounted for an estimated 3 percent of the total volume of containers. One of these cooperatives reported purchases from the California Fruit Exchange, Sacramento, Calif., which operates a supply department, while the other two

Table 6.--Sources of containers and packaging supplies reported by fruit and vegetable processing cooperatives, 1965

Source	Cooperatives		Percent of total purchases
	Number reporting	Percent of total ¹	
Supply cooperative	3	4	3
Local private supplier	6	8	5
Direct from manufacturer	73	96	92
Total	82	--	100

¹ Percentages exceed 100 because some cooperatives purchase from more than one source.

obtained containers from a manufacturing plant they owned jointly.

Three cooperatives in the United States operate their own can-manufacturing plants at the present time. California Cannery and Growers, Inc., and the Tri Valley Growers, both at San Francisco, own and operate jointly the C T Supply Company, Inc., Fremont, Calif. The Winter Garden Citrus Products Cooperative, Winter Garden, Fla., manufactures 50 to 75 percent of its own tin cans (see p. 23 for a complete discussion of existing cooperative can manufacturers).

Establishment of another cooperative can-manufacturing plant is currently in the active planning stage in one area and is under serious consideration in at least two other areas.

Direct purchases from the manufacturers were the primary source of cans, bottles, and paperboard boxes, accounting for 92 to 96 percent of the total.

Local private suppliers primarily served as a source for other than standard high-volume items, supplying about 15 percent of the total. Specialty items such as plastic bags, poly film, wooden boxes, and metal drums composed the majority of purchases from these suppliers.

PURCHASES DIRECT FROM MANUFACTURERS

Processors generally purchased containers from two or three different manufacturers to fill their requirements because they wanted to avoid becoming too dependent on any one company and they like to keep the various manufacturers "competitive."

Advantages.--Processors generally appeared quite satisfied with the service provided by container manufacturers.

The most important advantage in dealing directly with manufacturers was related to service in 45 percent of the responses (table 7). (More detailed comments are shown in appendix table 1.) Processors' production lines run on a very tight schedule and stoppage of production is very costly. For this reason, processors place great value on good service pertaining to scheduled deliveries, general dependability, and servicing of equipment. Technical representatives of the container manufacturers will normally work closely with the processor on problems such as plant layout, design of equipment, servicing of equipment, and container specifications.

Price was given as an advantage by 24 percent of the respondents. Fifteen percent reported they were purchasing from the lowest

Table 7.--Principal advantages of purchasing containers and packaging supplies direct from manufacturers, 1965

Advantage	Number of times mentioned	Percent of total
Price.....	26	24
Service.....	48	45
Quality.....	20	19
Most convenient source available.....	10	9
Other.....	3	3
Total.....	107	100

priced source. Others listed discounts, freight savings, and credit terms as price advantages.

Processors generally believed they were getting a good quality product, and if problems did occur, the manufacturer would act quickly to make the necessary adjustments at no cost to the processor. Quality advantages such as product guarantee and quality control were given by 19 percent of the cooperatives reporting. Some processors also believed there were definite advantages in having the most advanced product or in working closely with the manufacturer to obtain a specialized container.

Disadvantages.--Only 15 percent of the cooperatives purchasing directly from manufacturers mentioned any disadvantages. A few cooperatives believed that insofar as manufacturers required that they purchase in large quantities, the resulting higher inventories of containers and packaging supplies represented a disadvantage in dealing directly with the manufacturer. The distance required to haul containers, the possibility of a strike situation, and no other competitive source available were also regarded as disadvantages.

USE OF SUPPLY COOPERATIVES

Supply cooperatives were a minor source of containers and packaging supplies because

only two were reported handling such items. Manufacture of tin cans, found in three other associations, appears very successful and is responsible for considerable savings.

Advantages.--The primary advantage given for the purchase of containers through supply cooperatives or for the manufacture of tin cans was lower cost. Manufacturing cooperatives reported that the advantages of manufacture were the avoidance of such sales costs as salesmen's salaries, advertising, and various service costs, and a reduction in administrative overhead.

Research and development constitute large expenses for major manufacturers. In both of the container-manufacturing cooperatives included in this study, very small expenditures were being made on these activities. In the long run, however, such savings in cost may be self-defeating.

Disadvantages.--Disadvantages of supply cooperatives generally centered around service factors. A few processors believed that cooperative supply associations were generally unable to keep sufficient stock on hand and to provide adequate service. Some stated that the use of supply cooperatives would result in higher prices as processors can usually buy as cheaply as supply cooperatives, especially where major items normally are purchased directly from manufacturers.

The rapid rate of technological change existing in the container industry today was regarded as the biggest disadvantage of cooperative manufacture of cans. If a major change in technology occurred, such as widespread consumer acceptance and use of the easy-opening can for fruits and vegetables, the present cooperative manufacturing plants would be obsolete and other firms in the industry, which are spending considerable time and money on research and development now, would have a definite competitive advantage. The supply cooperatives might then have difficulty in developing a similar container.

Cooperatives also believed that a plant would have to run one line for several years before it became profitable. With cooperative can-manufacturing plant volume now relatively small, any extensive research and development work is nearly prohibitive.

PURCHASE THROUGH OTHER SUPPLIERS

Advantages.--Cooperative processors normally purchased containers and packaging supplies from suppliers other than cooperatives for service reasons. Most purchases from private suppliers consisted of special-type containers or small lots of various size plastic bags and cello wraps.

Prompt delivery, convenience in dealing with the local supplier, and reduced inventory needs were other advantages given for dealing with private suppliers.

Disadvantages.--Cooperative processors reported that one of the major disadvantages in purchasing containers through private suppliers was related to costs. Because of small volumes and wide varieties of containers and packaging supplies handled, cost would normally be higher than for direct purchases from manufacturers.

Other disadvantages were related to service factors such as lack of warehouse facilities, lack of service, and poor delivery service.

Joint Purchases

Joint purchase, in which several processors pool their orders to take advantage of quantity discounts or structural price advantages, was not common among fruit and vegetable processors. Only 11 percent of the cooperatives interviewed had some experience with joint purchases which usually accounted for a small percentage of the cooperatives' total container expenditures.

The standard procedure in joint purchases is for one cooperative to take the lead, receive and pool the orders from the other associa-

tions involved in the joint venture, and submit the pooled order to the manufacturer. The manufacturer normally ships the container and packaging supplies directly to the user associations, but invoices only the lead cooperative. This cooperative then invoices and receives payment from the other associations and pays the manufacturer. The lead cooperative generally receives a 1-percent cash discount for its effort. In one case the lead cooperative was a regional marketing cooperative, and in other cases it was the largest cooperative of the group.

Purchases of this type were usually for items such as freezer cartons, berry boxes, poly overwrap, plastic bags, and wine cases. Processors were able to make certain savings through joint purchase, depending on volume purchased and the existing price structure. No major disadvantages were reported, although lack of communication and change of management were mentioned as possible problem areas.

Frequency of Purchase

Processors of fruits and vegetables normally purchase containers on a continuing basis throughout the processing season. The standard practice is to estimate the seasonal volume and place an estimated order for the year or for the season. Delivery orders are then placed on a 1- to 3-day basis to correspond with the processing schedule. Every effort is made to schedule the delivery of containers to correspond with the actual pack. This allows for the movement of containers directly from the truck to the processing line.

Because of the critical timing factor, the supplier and the packer necessarily work closely together with daily or at least weekly contact to insure that a supply of the right type of containers will be on hand when needed. Thus, the major factor influencing the frequency of purchase and delivery arrangements for containers is the volume of processing operations (table 8).

Table 8.--Factors influencing frequency of purchase and delivery arrangements for containers and packaging supplies, 1965

Factor	No. of times mentioned	Percent of total
Seasonal volume of packing operation.....	30	73
Pricing structure.....	4	10
Supplier delivery schedule.....	4	10
Warehouse space available.....	2	5
Inventory cost.....	1	2
Total.....	41	100

Frequency of purchase is not particularly critical for cartons, overwraps, and labels--items which can be more efficiently warehoused than metal cans or bottles. Factors such as the pricing structure, supplier delivery schedule, and inventory cost are of more importance. Available warehouse space, however, can be important for these items.

Overall, 60 percent of the processors reported that their suppliers delivered orders in less than 7 days (table 9). Various types of

cans were available on shorter notice, with 37 percent reporting that they could receive delivery in 1 day or less. An additional 37 percent reported delivery took from 2 to 7 days from the time the order was placed; this time was based on the fact that the manufacturer had an estimate of the type of container needed and had his production line geared to anticipated needs. If a manufacturer were required to build an order of tin cans from the basic raw materials this process would take approximately 10 to 14 days.

Delivery time for bottles was less than 7 days for 55 percent of the manufacturers and more than 1 month for 27 percent. Those reporting less than 7 days would need to draw upon the manufacturer's stocks of standard-size bottles. Over 30 days were required by wineries preferring a specially designed bottle.

Paperboard boxes, such as canning cases, and master cartons are usually available on a "less than 7-day" basis. Longer delivery time is required when a special design or special type of printing is requested.

Table 9.--Number and percentage of fruit and vegetable processing cooperatives reporting specified order delivery times for containers and packaging supplies purchased, by type of container, 1965

Order delivery time	Cans		Bottles		Paperboard boxes		Packaging supplies		Total purchase	
	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹	No. of cooperatives	Pct. ¹
1 day or less.....	10	37	4	37	6	32	1	6	21	29
2 - 7 days.....	10	37	2	18	8	42	3	19	23	32
8 - 14 days.....	2	7	1	9	2	10	9	56	14	19
15 - 30 days.....	3	11	1	9	2	10	1	6	7	9
Over 1 month.....	2	7	3	27	1	5	2	12	8	11
Total.....	27	100	11	100	19	100	16	100	73	100

¹ Totals may not add to 100 due to rounding.

Packaging supplies, consisting primarily of labels, normally require more time for delivery than the standard containers because of the many different sizes, designs, and types of printing employed. Labels cannot be made up ahead of time or stockpiled by the manufacturer.

Inventory and Storage Policies and Problems

Management of inventories and efficient use of storage space are usually very complex because of the seasonal nature of the pack, volume and bulkiness of the goods processed, and the cost of maintaining excessive inventories. However, inventory and storage did not present major problems for the processors contacted in the study.

INVENTORY POLICIES AND PRACTICES

Processors maintained only an operating inventory of containers and packaging supplies and relied on the manufacturer to deliver containers, especially cans and bottles, on an "as needed" basis.

Processors maintained an exceptionally low inventory from one year to the next. The average beginning inventory for containers in 1965 was \$52,095, representing only 2.8 percent of the annual container purchases. Ending inventory was slightly less--\$46,000, or 2.4 percent of annual container purchases. Peak inventories generally ran from 5 to 10 percent of annual purchases, with an average of 7.2 percent (table 10).

Purchases of containers reported by processors contacted through personal interviews averaged \$1,888,495, higher than the average for all cooperatives contacted.³ Purchases ranged from none to \$20 million, with the av-

erage amounting to about 17 percent of the total value of goods sold.

Inventories of packaging supplies represented a higher percentage of annual purchases than did inventories of containers (table 10). Beginning and ending inventories for 1965 at \$14,600 and \$15,179, respectively, averaged about 20 percent.

Peak inventories of packaging supplies averaged 63 percent of annual purchases. Packaging supplies are ordered on a lot basis and stored until used rather than on an "as needed" basis. This difference is reflected in the percentage of total purchases maintained in inventory.

STORAGE PRACTICES AND PROBLEMS

Storage space was not considered a major problem by the fruit and vegetable processors interviewed, but 50 percent of this group did consider it a limiting factor.

Only 21 of the cooperatives reported the actual amount of storage space used because of the difficulty in making this calculation. Frequently, storage for empty containers is used in conjunction with storage for processed goods. As the processed goods are moved out, more and more space becomes available for container storage which is sometimes rented to container suppliers as off-season storage or used for the storage of containers under various warehousing allowances.

In some instances, however, processors believed that warehouse space was so valuable that they never could afford to store empty containers, regardless of price advantages or warehouse allowances. (Information on warehousing allowances available is included on page 17.)

Fifty-seven percent of the reporting cooperatives used less than 10,000 square feet of storage space, about 20 percent reported the use of 50,000 square feet or more, and 14 percent indicated they used no storage space for empty containers and packaging supplies (table 11).

³ Personal interviews were conducted in areas of intense concentration of fruit and vegetable production where the largest cooperatives are located.

Table 10.--Value of inventories and purchases of containers and packaging supplies by fruit and vegetable processing cooperatives, 1965

Item	Containers			Packaging materials		
	Average	High	Low	Average	High	Low
	<u>Dollars</u>					
Beginning inventory	52,095	238,000	0	14,600	100,000	0
Purchases.....	1,888,495	20,000,000	¹ 0	76,073	300,000	189
Peak inventory.....	210,300	1,430,000	0	47,585	110,000	40
Ending inventory	46,000	200,000	0	15,179	110,000	0

¹ One cooperative used large wooden boxes for bulk shipment purchased in earlier years. These boxes usually last for 5 years, and as a result, no purchases were reported.

Table 11.--Number and percentage of fruit and vegetable processing cooperatives reporting specified amounts of storage space used for containers and packaging supplies, 1965

Storage space used (square feet)	Number of cooperatives reporting	Percent of total
None	3	14
Less than 5,000	6	29
5,000 - 9,999	3	14
10,000-24,999	4	19
25,000-49,999	1	5
50,000 and over	4	19
Total	21	100

Pricing Policies

Prices cooperative processors paid for containers were based on a number of factors and varied considerably.

PURCHASE OF CONTAINERS AND PACKAGING SUPPLIES AT LIST VS. NEGOTIATED PRICES

Seventy percent of the fruit and vegetable processors reported the purchase of containers and packaging supplies at established

list prices. The remainder of the cooperatives reported that purchases were made at prices arrived at through negotiation.

Standard size and weight cans, bottles, and corrugated cardboard cases were purchased at established list prices, especially in processing areas. Processors reported that when they purchased containers and packaging supplies are at list prices, they frequently had some flexibility to negotiate for various discounts, service features, delivery schedules, or credit terms.

In situations where special container specifications were required, such as for grape juice or apple juice, specially designed wine bottles, or specially printed labels or cartons, prices were usually negotiated.

Volume of purchases and specifications of the container were the major factors considered in arriving at a negotiated price for purchases of container and packaging supplies (table 12). Other factors were length of the contract period (one processor reported a 40-year arrangement), delivery capability, and coordination of production with that of another processor. Warehousing agreements were also considered in the negotiations. Warehousing allowances are available from manufacturers for accepting delivery of containers before the processing season actually begins.

Table 12.--Factors determining negotiated prices for containers and packaging supplies purchased by fruit and vegetable cooperatives, 1965

Factor	Number of times mentioned	Percent of total
Volume of purchase	8	40
Competitive condition in container industry	2	10
Specifications of container	4	20
Length of contract period	2	10
Warehousing agreements	1	5
Delivery capability	1	5
Possibility of coordinating the timing of production run with that of another processor	1	5
Luck	1	5
Total	20	100

CASH DISCOUNTS

The availability of some type of discount for prompt payment is a generally accepted practice in the container industry. Eighty-seven percent of the cooperatives contacted reported the availability of a discount for prompt payment. When available, 90 percent of the processors took advantage of the discounts. Those who did not take full advantage of the discount failed to do so because of the general financial condition of the company or a shortage of working capital. One cooperative reported its payments were made on a negotiated basis three times a year.

The most common type of discount available on all types of containers was the standard 1 percent for cash within 10 days--net 30 days (table 13). Approximately 65 percent of the cash discounts reported for cans and glass were for 1 percent. The remaining 35 percent varied between 1 and 2 percent.

An additional discount of 1.5 to 2 percent at the end of the year was also available on cans only to some of the larger cooperatives if all orders were discounted at 1 percent throughout

the year. This allowed for a maximum total cash discount of 2.5 to 3 percent if all conditions were met.

Eighty-five percent of the cash discounts reported on corrugated cardboard containers were for 1 percent. Terms ranged from cash within 10 days to 30 days. Thirteen percent reported they were negotiated with each contract.

Cartons for frozen fruits and vegetables, labels, and other items were normally discounted on a 1-percent basis.

QUANTITY DISCOUNTS

Various forms of quantity discounts, brokerage allowances, and warehouse allowances were available to 50 percent of the reporting cooperatives. Discounts of this type were more often available on standard items such as cans and corrugated cardboard cartons than on items of lesser volume such as glass, poly bags, labels, and cello overwrap.

Quantity discounts were a more integral part of the pricing system in areas of the greatest concentration of processing such as parts of California, Oregon, and Florida. In areas with lesser concentration, such as parts of Michigan, Pennsylvania, New York, and all other States covered by personal interviews, quantity discounts were less prevalent.⁴

With the prevalence of established list prices for standard-type containers in the processing areas and the competition among container manufacturers, the various types of quantity discounts provide some measure of price differentiation between container manufacturers. Discounts also provide some flexibility for negotiations between the processor and supplier.

⁴ This is partially reflected in a comparison of data obtained from the mail survey with data obtained from personal interviews. Only 30 percent of those contacted by the mail survey reported the availability of any form of quantity discounts compared with 60 percent of the processors contacted by personal interview.

Table 13.--Rate and basis for prompt payment discounts for purchase of containers and packaging supplies by fruit and vegetable processing cooperatives, 1965

Container item	Rate of cash discount	Basis	No. of times mentioned
	<u>Percent</u>		
Cans	1	10 days-net 30 days	24
	1	Cash	5
	1	Dependent on billing date	1
	1 1/2	10 days-net 30 days	2
	1 - 2	10 days-net 30 days	8
	1 - 2	Negotiated	3
	1 & 2	1% 10 days; plus 2% at year-end if all purchases were discounted at 10 days	2
	3	Cash	<u>1</u>
	Total		46
Glass	1	10 days - net 30 days	16
	1	Cash	2
	1 - 2	10 days - net 30 days	6
	1 - 2	Negotiated	<u>4</u>
	Total		28
Corrugated cardboard	1	10 days - net 30 days	26
	1	10th of month	1
	1	Negotiated	5
	1	30 days	1
	2	15th of month	2
	2	Cash	3
	2	10 days - net 30 days	<u>1</u>
	Total		39
Frozen product containers	1	10 days - net 30 days	7
Labels	1	10 days - net 30 days	7
		Net 30 days	<u>1</u>
	Total		8
Other	2	30 days	3
	1	10 days - net 30 days	<u>1</u>
	Total		4

Approximately 60 percent of the processors took full advantage of such discounts when offered. An additional 25 percent indicated that they were not always able to take advantage of the discounts, but did so whenever it was in the interest of the cooperative. Available warehouse space, inventory status, and available capital were the primary factors considered in making this type of purchasing decision.

Only 14 percent were not able to take advantage of the available discount or allowance. Lack of sufficient warehouse space was the main reason for not doing so. One firm indicated that it was purchasing glass containers from three different suppliers and as a result lacked sufficient volume from any one of the three firms to qualify. This situation was being corrected.

Quantity discounts were available in several forms, ranging from extended credit terms to a 5+5+5 percent discount on corrugated cardboard (table 14).⁵ Most frequently, quantity discounts were simply 5 percent or 5+5 percent for purchase of containers in truckload or carload lots.

The largest discounts were available on corrugated cardboard containers, of the four processors reporting discounts on cardboard of 5+5+5 percent, two indicated these terms were available based on length of contract period. The most common discount on cardboard was the simple 5 percent on volume. One processor reported 5 percent on volume above car lots plus additional discounts in terms of printing cost on large orders (table 14). Twenty percent of the quantity discounts on cardboard varied depending on negotiations.

The maximum discount available on cans was 5 percent. This discount, based on volume, was reported by 36 percent of the cooperatives. An additional 45 percent of the associations reported quantity discounts in the form of extended credit terms.

⁵ Five percent on volume, 5 percent as a brokerage allowance, and an additional 5 percent at year end.

Warehouse allowances were generally on a per month basis, computed from the time the processor accepted shipment of the containers to the time they were actually filled. Rates for can storage varied depending on date of purchase; reported discounts ranged from \$0.18 per pallet per month to extended cash discount terms from 10 to 45 days.

Rates for corrugated cardboard ranged from 0.0065 percent per month to 2 percent for warehousing; the average was about 0.2 percent per month.

Only two processors reported any type of brokerage allowances, and both were for 5 percent on corrugated cardboard.

Preseason allowances, reported by five processors, normally took the form of extended credit terms.

Transportation

Containers and packaging supplies were normally transported from the suppliers' plants directly to the processors' plants in truckload lots. An estimated 80 percent of the volume was transported in full truckload lots and an additional 16 percent was transported in full carload lots. The remaining 4 percent represented special items or various packaging supplies such as cello overwrap and labels, and were transported in less than truckload lots. Tin cans, bottles, canning cases, and other cardboard cartons were generally shipped in full truckload lots, or if a long haul was required, by rail.

In areas of concentrated fruit and vegetable production, processors usually are located within a 50-mile radius of the supplier's plant or warehouse. In these areas, containers and packaging supplies are priced on a uniform delivered price, equalized to buyers at the closest manufacturing plant.

Processors purchased approximately 70 percent of their container and packaging supplies on a delivered basis. Where containers

Table 14.--Quantity discount rates, brokerage allowances, warehouse allowances, or other allowances on purchases of containers and other packaging supplies by fruit and vegetable processing cooperatives, 1965

[M = 1,000]

Discount or other allowance rates and terms		Number of times mentioned
Item and unit	Basis	
Quantity discounts:		
Cans		
5%	Volume	3
5%	Size 2 1/2	1
Varies	Based on negotiations	2
Extended credit	Volume	5
Total		11
Corrugated carboard		
5% + 5% + 5%	Length of contract	2
5% volume + 5% brokerage + 5% at year end		2
5% + 5% volume + (2% warehousing)		1
5% + 5%	Shipping cartons	1
5%	Volume	5
Varies	Based on negotiations	3
5% on volume above cartons plus additional discounts in terms of printing cost on large orders		1
Total		15
Example:		
	20M	71M
Carton cost (M)	\$115.85	¹ \$115.85
Printing cost (M)	28.40	2.35
Total cost (M)	144.25	118.20
Glass		
5% + 5%	Varies with volume	1
Varies	Based on negotiations	2
Total		3
Other		
5%	On cello	1
5%	On poly	1
\$3.00 per 1,000	Poly bags	1
Total		3
All types		32

¹Two colors.

Continued

Table 14.--Quantity discount rates, brokerage allowances, warehouse allowances or other allowances on purchases of containers and other packaging supplies by fruit and vegetable processing cooperatives, 1955--Continued

Discount or other allowance rates and terms		Number of times mentioned
Item and unit	Basis	
Warehouse allowances:		
Cans		
18¢ per pallet per month		1
Allow 45 days instead of 10 for cash discount		1
Varies--depends upon date of purchase		3
Preseason rate		1
		<hr/>
Total		6
Corrugated cardboard		
2.0% for warehousing (plus 5% + 5% for volume)		1
.5% per month		1
.0065% per month		2
Varies--depends upon date of purchase		1
		<hr/>
Total		5
Glass		
Varies--depends upon length of time stored		1
Other		
Metal drums--allow 45 days instead of 10 for cash discount		1
Brokerage allowances:		
Corrugated cardboard		
5% brokerage (plus 5% + 5% for volume)		1
5% trade allowance (plus 5% for volume)		1
		<hr/>
Total		2
Other:		
Cans		
Extended credit for preseason purchase		1
Corrugated cardboard		
Extended credit for preseason purchase		1
Allowance given but not specified		3
		<hr/>
Total		4
		<hr/>
All types		20

were purchased f.o.b. supplier's plant or warehouse, the distance from the shipping point to the processor's plant was more than 50 miles. In these cases, freight costs ranged from 4 to 10 percent of the initial cost of the containers. For instance, Cherry Growers, Inc., Traverse City, Mich., was required to ship its cans 150 to 250 miles to its individual plants. Half were shipped by rail and half by truck. For a load of 20,000 cans moving from Chicago to Traverse City, a distance of about 250 miles, freight charges were \$169; from St. Joseph, Mich., a distance of about 175 miles, the cost was \$121. The average freight charge reported by Cherry Growers was about \$120 per load. Another processor however, reported freight costs of about \$250 for a load of 2,200 cases of cans that was hauled 150 to 200 miles.

When processors were asked for suggestions on reducing transportation costs on containers, 75 percent indicated that transportation costs were about as low as possible, or that freight rates were equalized and the processor had no opportunity for further reduction in freight rates. Five processors minimized transportation costs by using their own trucks on a backhaul arrangement. This, of course, is practical only when a processor or regional cooperative associated with a processor already owns or leases a fleet of trucks.

The use of lighter weight material such as aluminum vs. steel is a very real possibility for reducing transportation costs. Another possibility is to establish a can-manufacturing plant in an area if otherwise needed.

Specifications and Prices Paid

Comparison of prices paid for containers and packaging supplies from various sources was not possible since virtually all containers were purchased directly from manufacturers. In the case of plants owned by cooperatives, prices of cans they produce are based on the standard industry prices for the area. The operating savings are then returned to the parent cooperatives at the year end in the form of patronage refunds.

Prices paid by fruit and vegetable processors in 1965 for purchases direct from the manufacturer were calculated on the basis of data obtained in both personal interview and mail survey. They are shown in appendix tables 2-7. Prices shown represent net prices paid by processors--list prices minus the various discounts obtained by the processors.

The greatest variations in net prices paid for metal cans in 1965 were reflected in the most commonly reported sizes such as in 6-oz. juice, 8-oz. tall, No. 303, No. 2 1/2, 46-oz. juice, No. 10, and the No. 30 frozen tin (table 15).

The wider variations in prices reflected possible regional differences and variations in freight costs, quantities purchased, and material specifications. The weight of the metal for cans varied widely, depending on the product the cans were to be used for. The type of finish--plain, inside enamel, and both inside and outside enamel--also varied.

Prices for glass containers reflected the cost of cardboard cases used for shipping the empty bottles and the finished product (appendix table 3). Little variation, however, was observed among prices reported by processors for glass bottles. Wineries reported an average net cost per case of about \$1. Since each brand of wine is identified partially by its distinctive bottle and each winery has developed its own type of bottle through arrangements with the manufacturer, cost data for each type of bottle have little meaning.

There also was considerable variation in the prices paid for the standard-size corrugated cardboard cannery cases, such as those for the 6-oz. can, No. 303 can, No. 2 1/2 can, and the No. 10 can. The high prices were from 3 to 51 percent over the low prices for this group.

Differences in type and extent of printing counted for some of the variations in container prices. Other variations were due to material specifications, quantities purchased, freight costs, and possible regional differences. Discounts accounted for a larger percentage of

Table 15.--Variations in net prices paid for metal cans and cardboard cannery cases by cooperative processors, by type of container, 1965

Type of container	Size or number	Net price per 1,000			Percentage that high price was over low price
		High price	Low price	Difference	
	<u>Size</u>	<u>Dollars per 1,000</u>			<u>Percent</u>
Metal cans:					
6-oz. juice.....	202 x 314	27.24	19.04	8.20	43
8-oz. tall.....	211 x 304	26.12	20.68	5.44	26
No. 303.....	303 x 406	36.26	26.96	9.30	34
No. 2 1/2.....	401 x 411	51.60	43.56	7.04	16
46-oz. juice, plain.....	404 x 700	84.89	76.87	8.00	10
No. 10.....	603 x 700	138.24	105.04	33.20	32
No. 30 frozen, tin.....	--	495.00	325.63	169.37	52
Corrugated cardboard cannery cases:	<u>Cans per case</u>				
6-oz.....	48	78.96	57.90	21.06	36
8-oz.....	24	72.00	55.95	16.05	29
No. 303.....	24	73.11	58.81	14.30	24
No. 2 1/2.....	12	81.55	79.47	2.08	3
No. 2 1/2.....	24	113.03	106.80	6.23	6
No. 10.....	6	142.40	94.05	48.35	51

the variation in corrugated cardboard prices than for tin or glass. Discounts on cases ranged from 1 percent to a high of 5 + 5 + 5 + 1 percent, a variation of 16 percent from the list price.

Examples of prices paid for industrial containers and various consumer packages were largely single observations as reported by processors through personal interview and mail survey.

Label costs for the various sizes of cans ranged from \$2.30 to \$9.14 per thousand, with an average of about \$5.50. Average cost for labels for wine bottles averaged slightly more, at \$6.20 per thousand. Considerable variation in size, type of printing, and number of colors exists in the types of labels used. Frequently, labels for private brands are supplied by the companies purchasing the finished product; thus the processing cooperatives are not involved in the purchasing.

Trends in Container Uses

The container industry is now going through a period of very rapid technological change, both in the type of containers used and in the material specifications.

The most significant and rapid changes are taking place in the can industry. Basically, there is a trend toward the use of a lighter weight can as well as the spiral-wound composite container for concentrated fruit juice (table 16). One processor reported that the use of the composite can reduced container costs as much as 50 percent. The widespread consumer acceptance of the easy-opening can is also expected to affect the fruit and vegetable processing industry. Leading can manufacturers are currently attempting to develop an easy-opening can or rip-top can for fruits and vegetables. Some processors expect to see this major development within the next few years.

Table 16.--Significant trends in the use of containers as reported by fruit and vegetable processing cooperatives, 1965

Trends	Number of times mentioned
Cans:	
Gradual shift to a lighter weight can	3
Shift from composite can (fiber with metal ends) to an all-fiber container	2
Increased use of spiral-wound composite container (has reduced container cost as much as 50%)	1
Gradual improvement and increased use of fiber composite can for concentrated frozen juice	2
Shift to easy-opening can	2
Expect development of rip-top can for fruit and vegetables	1
Change from 6-oz. to 8-oz. container for citrus juice	1
46-oz. cans are decreasing in importance (apple juice)	1
Shift to larger grape juice container (15 oz. to 50 oz.)	1
Move to lighter weight can; less tin plate and higher vacuum	1
Material specification changing; i.e., welded instead of soldered can	1
Total	16
Glass:	
Gradual change to paper and plastic from glass and metal as technology develops	1
Gradual change from quart to smaller bottle (wine)	1
Change to lighter weight glass and cartons to reduce freight and material costs (wine)	1
Total	3
Corrugated cardboard:	
Shift to smaller cases; i.e., 12 cans instead of 24 to a case	1
White rather than brown kraft carton (more attractive)	1
Use only one-color printing on shipping carton (never leaves back room of retail store, so why pay for fancy 2-3 color carton printing)	1
Total	3
Other:	
Larger poly bags for frozen vegetables due to IQF method of freezing (mixed vegetables)	1
Haven't changed any in the past 20 years	1
Total	2

Container specifications are also changing. In 1965, one can company developed a process for cementing side seams and introduced a tin-free can using such a process. The tin-free can is currently used for beer and is being tested for food products.

A further development, the "first commercially practical" welded can, has been announced by another can company⁶. It was available for consumer testing in the summer of 1966 and is expected to be commercially available in 1967.

Competitive containers such as paper cartons and blow-molded rigid plastic containers have retarded the growth of glass containers for food products.⁷ This trend can be expected to continue as new technology develops. One

processor reported the use of lighter weight wine bottles, primarily to reduce material and freight costs.

Observations of changes in uses of corrugated cardboard containers were too limited to reflect industrywide trends, but several seemed significant. One processor reported a shift to smaller cases for cans; for example, 12 cans per case instead of 24. Another major processor reported a trend toward the use of only one-color printing on shipping cartons. A third major processor reported the increased use of large plastic bags for frozen vegetables due to the IQF method of freezing. (The IQF method of freezing allows the user to pour out any desired amount of vegetable from the container, reseal the container, and replace it in the freezer.)

Container Manufacturing by Cooperatives

The possibility of cooperative manufacture of containers for processed fruits and vegetables can be illustrated to some extent through a review of the operations of can-manufacturing plants served by C T Supply Company, Inc., Fremont, Calif., and Winter Garden Citrus Products Cooperative, Winter Garden, Fla.

C T Supply Company, Inc., Fremont, Calif.

C T Supply Company was chartered under the California laws on March 10, 1964, to manufacture tin cans. California Cannery and

Growers, Inc., San Francisco, owns two-thirds interest and Tri Valley Growers, San Francisco, owns one third. C T Supply is controlled by its own board of directors which is interlocking with the boards of the two owner cooperatives.

Sales are made to the two affiliates on various terms. C T Supply serves about 15 individual processing plants located within a 30-to-50-mile radius of its can-manufacturing operations.

FACILITIES AND EMPLOYEES

C T Supply operates manufacturing plants at Fremont and Modesto, Calif. The largest plant, at Fremont, includes the main office and is a well-kept one-story concrete building covering about 200,000 square feet (figs. 3 and 4). The two plants employ about 325 people, including management and supervisory personnel, on a year-round basis.

⁶ The two metal surfaces are fused by electrically generated heat, and the power costs are less than the adhesives used in cans with cemented seam or the conventional soldered seam. Both processes permit lithography to be wrapped almost completely around the can.

⁷ U.S. Department of Commerce, Container and Packaging Quarterly Industry Report, Business and Defense Serv. Admin., Oct. 1965, p. 5.



Can manufacturing plant and office at Fremont, Calif., acquired by CT Supply Co. in 1964.



Plant of CT Supply Co., Fremont, Calif., is a one-story concrete building covering about 200,000 square feet.

OPERATIONS

The company purchases all of the basic raw materials used in the manufacturing of cans and normally keeps a 30-day supply on hand. Tin plate, which is received in coils, comes from all over the United States. The company manufactures the 12 most commonly used sizes of cans--ranging from No. 202 to one-gallon.

Orders from the member processing plants are phoned directly into the production planning department and are then consolidated into the

master production schedules. This is a major area of savings because it eliminates all selling costs such as salesmen's wages, advertising, and promotion. Only one man is employed as a technical assistant to service the accounts.

The cans are all sold at standard list prices for that area and a 1-percent discount is allowed for cash payment within 10 days. All sales are made f.o.b. the manufacturing plant. Both cooperatives have trucking facilities to haul products to markets and to pick up and

deliver the cans to their own processing plants on a backhaul basis. California Cannery and Growers owns and operates its own fleet of trucks; Tri Valley contracts with a trucking agency for this service.

According to C T Supply management, a successful operation requires year-round activities. In the processing industry, which is basically seasonal, cans must be stored during the off-season. The processing cooperatives owning C T Supply must be able to handle the cans on a year-round basis as C T Supply has no warehousing facilities. Moreover, they cannot afford warehousing space for off-season storage of empty cans. Therefore, as the cooperatives move the finished products out during the off-season months, this warehouse space becomes available for storage of empty cans.

According to an officer of one of the cooperatives owning C T Supply, it had net savings of over \$2 million in 1965. With a fully established operation in 1966, the owner cooperatives expected sufficient savings to recover their combined investment of \$9 million in about 3 years.

PROBLEMS IN OPERATION

The major problem facing C T Supply Company is the rapid rate of technological advancement in the container industry. As C T Supply has only limited research and development facilities and budget, a major change would place this association at a definite disadvantage. Currently, the equipment is depreciated over a 12-year period. Management believes, however, that it could adapt to major technological changes and supply the type of container demanded by the processor-owners.

Winter Garden Citrus Products Cooperative, Winter Garden, Fla.

The Winter Garden cooperative has owned and operated a small can-manufacturing plant for about 5 years as an integral part of its

processing and marketing operations. All cans manufactured are produced exclusively for its own use. The operations of the can plant are consolidated in the total operating statement of the cooperative.

FACILITIES AND EQUIPMENT USED

The manufacturing plant is located in the same complex of buildings as the processing operations of the cooperative. When the can plant was started, it was installed in an existing one-story building, 50' x 100', and all equipment was leased from a metals company. This enabled the cooperative to begin operation with a minimum of invested capital. The equipment is currently on a 5-year lease.

OPERATIONS

The plant maintains a relatively flexible operating position, depending on the demand for cans. During the canning season, December through May, operations are conducted on a two-shift basis and at this time a maximum of 16 persons may be employed. During the off-season, only one shift is utilized and employment drops to about 8 full-time employees. Management believes that one of the essential aspects of a successful operation is the ability to operate on a year-round basis. Cans manufactured during the off-season are stored in the cooperative's warehouse as the finished products are moved out.

Although detailed information on the plant's operation was not available, the total value of the cans manufactured was estimated to be between \$2 million and \$3 million. This would represent more than 50 percent of Winter Garden's needs. Total sales of the Winter Garden Cooperative in 1965 were reported at \$25 million and the total value of cans used was between \$3 million and \$4 million. Management indicated that substantial savings (estimated at about 10 to 15 percent) were being made available to growers through the manufacturing operation.

Basic raw materials for the manufacture of cans are shipped in from Alabama in the form of lithographed sheets. All cans manufactured are from lithograph stock. Lithography is to specifications of retailers who purchase the finished goods.

As all cans manufactured are used exclusively by Winter Garden, no sales force is necessary. Also, Winter Garden maintains no research and development personnel; thus, administrative overhead is kept at a minimum.

TYPE OF CANS MANUFACTURED

Only two types of cans, the 6-oz. and 12-oz. metal cans, are produced in the Winter Garden plant; these represent the highest volume of all cans used. Other cans are purchased from the major can manufacturers.

Management reported the break-even point on the 6-oz. and the 12-oz. can at about 30 million to 50 million, depending on size, weight, and competitive prices.

PROBLEMS IN OPERATION

Management anticipates that a period of change in the can industry during the next few years may place the cooperative at a definite disadvantage. For this reason, management is not interested in any expansion program or in taking on new customers as the plant does not have the capacity to fully supply its own needs at this time. Further expansion and sales to other cooperatives would result in adding a sales force or technical representatives and consequently increase overhead costs.

Further Opportunities for Cooperative Purchase or Manufacture

Most container requirements of the cooperative fruit and vegetable processors are supplied direct from the manufacturer. Reports from cooperatives indicated that in most cases the market appears to be adequately covered by the major container manufacturers. However, a few large and medium-size cooperatives operate container manufacturing or fabricating plants on a profitable basis and at considerable savings to growers. Further, many other processors find it advisable to manufacture a substantial portion of their requirements--especially metal cans.

Although no cooperative purchasing agencies served the processors contacted in this study, there were examples of successful joint purchases of containers among processors. Joint purchases of packaging supplies were usually limited to a relatively small percentage of the cooperative's total container expenditures and involved items such as freezer cartons, poly overwrap, plastic bags, and wine cases. This arrangement enabled processors to make substantial savings, depending on volume and existing prices.

Cooperative Purchase

Processors were asked their opinions regarding opportunities for cooperative purchase of containers and packaging supplies in their respective areas. As shown in table 17, approximately 60 percent thought there were very limited or no opportunities for cooperative action. The remainder believed there were possible or definite opportunities.

Processors who thought their opportunities for cooperative purchases were limited were generally those whose purchases were large, and who would gain very little advantage through attempts to consolidate purchases with other processors. Another anticipated difficulty was getting sufficient volume within a small enough geographical area to be practical. For example, one olive processor indicated that it was the only olive processor in the area. Another processor, a winery, believed it would be very difficult to get a sufficient number of wineries to cooperate because they had each developed their own distinctive bottles over a period of years and

Table 17.--Opportunities for cooperative purchase of containers and packaging supplies reported by fruit and vegetable cooperative processors, 1965

Comments regarding opportunities	Number of times mentioned
No opportunity:	
No opportunity	13
Would not be practical	2
Little opportunity--are currently buying in volume and would be no additional advantage.....	4
Only processing co-op in the country so would not have enough volume	3
We can now purchase as cheaply as a co-op	1
Wine co-ops will not cooperate because they do not want to let their competition know the prices they are paying.....	1
Subtotal.....	24
Possible opportunity:	
Possible opportunity.....	2
Depends on price and service they could provide.....	2
Always a possibility, especially for cartons	1
Would welcome it if they could get enough volume	2
Would purchase from co-op if supply and price were competitive	1
May have some advantage, but problems may arise to offset the advantages	1
We are interested if there would be savings	2
Subtotal.....	11
Definite opportunities:	
A paperboard co-op would be very beneficial in many ways.....	1
Opportunity for fig packers to purchase certain standard items cooperatively	1
Co-op buying and selling is the only way small business can stay in operation.....	1
O.K.	1
Would be no substitute for it	1
Would lower price and might be more efficient	1
Subtotal.....	6
Total.....	41

each was reluctant to release any specific price information concerning purchases.

In an area where there are several relatively small processors, cooperative purchase appears to be a definite possibility. Managers believed savings of 5 to 10 percent could be realized from volume discounts, brokerage allowances, or negotiated prices. In some areas, however, where many small processors did exist, mergers have taken place and a once independent cooperative is

now a member plant of a larger cooperative. Therefore, centralized purchasing is being utilized by the large cooperatives for their individual plants with the same effect as cooperative purchasing.

Cooperative Manufacture

A few large processors are very interested in the feasibility of manufacturing metal cans, and to a limited extent in fabricating

corrugated cardboard containers on a joint or cooperative basis.

Slightly over half of the processors believed that cooperative manufacture was either a possibility or a definite opportunity (table 18). They thought that savings from manufacturing would exceed those from cooperative purchase of containers. Opinions ranged from "possible opportunity if enough volume could be developed" to "definitely are going into can manufacture" and "hope to get into the fabrication of corrugated cardboard containers within 2 - 3 years."

OPERATING REQUIREMENTS

Requirements for the successful manufacture of cans varied among persons interviewed. Among factors causing variation are the size and weight of can, number of lines, local prices of tin plate, local labor and power rates, storage requirements, quality of equipment, and competency of the canmaker or plant manager.

Reports indicated that the minimum annual production of cans to operate an efficient plant on a break-even basis is about 12.5 million 46-ounce cans up to 40 million 12-ounce cans. Some, however, indicated a minimum of 10 million one-gallon cans and 50 million small No. 202 cans is needed. A plant producing only one size can may operate efficiently.

Approximately \$1.5 million would be required to establish a plant with one line making one size of can. This amount would provide land, building, equipment, and initial operating capital for material and personnel. About a third of this would be required for equipment. The total amount would vary, however, with local conditions and storage area requirements.

The number of employees needed to run a complete plant varies with supervision and production requirements. Reports indicated that for a one-shift operation a body line normally would require 6 or 7 employees and the end line would require about the same number.

Reports indicated manufacturing costs often are equal to 25 percent of the total cost of the can.

Net margins or savings may range from 14 to 17 percent expressed as percent of "cost of sales," depending upon efficiency of the plant, competency of the production management, and local selling prices.

Two and one-half to three years is considered a reasonable period for a plant to pay for itself.

POSSIBLE DIFFICULTIES

Slightly less than 50 percent of the processors interviewed believed there were only very limited or no opportunities for cooperative manufacture. Difficulties anticipated in establishing a cooperative manufacturing plant for containers are reflected in table 19. The principal problems they mentioned were:

It might be difficult to develop enough volume of standard sizes and types of containers to make the manufacturing process feasible. If one processor does not have the volume, then some type of organization or agreement must be made between two or more processors, such as that between the two owners of C T Supply Company, Inc. Also, special federations of cooperative processors, such as Citrus Central in Florida and Consolidated Agricultural Industries in California, could provide the leadership and organization for entry into container manufacturing.

The difficulty of getting processor managers to work together and to participate to the same degree as to benefit from economies of scale was considered important by some people.

Another difficulty anticipated by processors is competition from large, established companies in the container industry. Several major cooperative processors have made, or are in the process of making, long-term purchasing agreements with private manufacturers. Private industry has responded to these agreements by building plants in the local areas, primarily to serve their accounts.

Table 18.--Opportunities for cooperative manufacture of containers and packaging supplies, reported by cooperative processors, 1965

Comments regarding opportunities	Number of times mentioned
No opportunity:	
No opportunity	8
Not enough volume for manufacturing plant for our type of container	2
Can't manufacture in face of competition	1
Volume is too low and too many different sizes	1
Self-manufacture would require a large capital outlay, with perhaps an insignificant saving.	1
Only three co-op processors in 150-mile radius; wouldn't have enough volume for manufacture	1
Doesn't feel it would be of any advantage because of unique discounts	1
Not interested in further expansion of present plant because industry is going through period of change	1
Subtotal	16
Possible opportunity:	
Possible opportunity	3
Very possible--are now considering it and doesn't see why it wouldn't work	1
Possible opportunity in glass and paperboard for a few years but no opportunity in tin	1
Possibility of tin can manufacture; however this is limited because of short canning season	2
Possible opportunity if enough volume could be developed	1
Would be practical only if several co-ops joined to manufacture their own cans	1
Subtotal	9
Definite opportunity:	
Are definitely going into can manufacture and hope to get into the fabrication of corrugated cardboard containers within 2 - 3 years	1
Appears to be a good opportunity--a company is currently investigating the possibility	1
Definite possibility with the additional stability and volume caused by recent merger	1
Are now considering the possibility of a canning plant	1
Certainly for cans--not so much for cases or glass	1
It would be good if manufactured by co-op	1
We understand this is already working in some areas	1
Establishment of co-op manufacturing plants has some value	1
Subtotal	8
Total	33

Table 19.--Anticipated difficulties in developing the cooperative manufacture of containers and packaging supplies reported by cooperative processors, 1965

Difficulties anticipated	Number of times mentioned
Could not compete with present companies:	
Would have to compete with private industry	1
Existing long-term purchasing agreements	1
A major company already has market for tins	1
Presently leased to a major company	1
Would have problem competing with industry because of high cost of research and development	2
Container industry is going through a period of change so would not recommend it at the present time	1
Would have to be integrated all the way back to compete in corrugated cardboard container market	1
Subtotal	8
Other difficulties:	
Developing enough volume	8
Would be a problem to get cooperatives to cooperate	2
Problem now in the formation of the central organization	1
Question if capital investment would pay off	2
Seasonal nature of the business	2
Would not only involve serving the account but helping to train machine operators	1
Site location; freight factors; capitalization; normal feasibility	2
Subtotal	18
Total	26

Still another problem would be the costs of conducting research and development to meet rapid technological advancements, especially in the use of lighter weight materials, welded seams, and the easy-opening or rip-top can.

Analysis by Region

Four major fruit and vegetable processing areas--California; Florida; Washington and Oregon; and New York, Pennsylvania, and Michigan--produced a total of 261 million cases of canned vegetables, canned fruit, and canned and bottled juices, or about two-thirds of the U.S. total in 1964 (table 20). Brief comments on possibilities for further cooperative procurement of containers in each region follow.

CALIFORNIA

Major production is concentrated in California which alone accounts for 36 percent of the volume of the fruits and vegetables processed in the United States. Over half of U.S. production of canned noncitrus fruit and approximately 20 percent of the total U.S. production of canned seasonal vegetables and vegetable juices are processed in California.

Examples of leading cooperative processors interviewed in this State were: Sebastapol Cooperative Cannery, Sebastapol--apples; California Cannery and Growers, Inc., San Francisco--deciduous fruits and vegetablea; Guild Wine Company, Lodi--wine; Wyandotte Olive growers Association, Oroville--olives;

Table 20.--Packs of canned vegetables, canned fruits, and canned and bottled juices, by region, 1964

States	Canned seasonal vegetables	Canned fruit (noncitrus)	Canned fruit (citrus)	Canned fruit juices (noncitrus)	Canned fruit juices (citrus)	Vegetable juices	Total cases
	1,000 cases						
California	19,770	87,800	--	14,393	1,500	13,947	137,410
Washington and Oregon	18,981	9,896	--	¹ 22,963	--	(3)	51,840
Florida	2,901	21	4,265	--	27,071	--	34,258
New York	6,875	7,214	--	² 10,376	--	(3)	24,465
Pennsylvania	1,989	--	--	--	--	(3)	1,989
Michigan	2,239	8,117	--	1,113	--	(3)	11,469
Total	52,755	113,048	4,265	48,845	28,571	13,947	261,431
U.S. total	135,657	153,891	4,265	48,845	28,571	33,797	405,026

¹ Includes all other western States.

² Includes all eastern States except Michigan.

³ Included in U.S. total.

Valley Fig Growers, Fresno--figs; and Sun-Maid Raisin Growers, Fresno--raisins.

Opportunities for cooperative purchase or manufacture of containers and packaging materials in California would be conditioned by the following circumstances:

Cooperative Purchase.--Such action would be favored by the existence of a large number of firms processing similar or identical products within a limited geographic area; for example, concentration of fig production in the Fresno area, wine around Lodi, apples around Sebastapol, deciduous fruits in the Central Valley area, and so on. Many of these firms, such as the fig processors, pack in standard containers. Aggregation of the container purchases of several of these smaller processors would strengthen their bargaining position with respect to purchase prices.

In some instances, individual cooperative processors in California are so large that consolidation of purchases would not likely produce any substantial advantage. For example, the Sun-Maid Raisin Growers' plant at Kingsburg processes approximately 60 percent of all raisins produced in the United States. Capacity of this one plant is approxi-

mately 100,000 tons of raisins per year, valued at over \$35 million. Raisins are packed in standard containers under the "Sun-Maid" brand. Sun-Maid requires a line of specialty cartons and has negotiated an annual purchase contract, on favorable terms, with the same supplier for over 40 years.

Consolidated Agriculture Industries, Los Angeles, Calif., formed early in 1965, is composed of Sunsweet Growers, California Cannery and Growers, Lindsay Ripe Olive Company, Tri-Valley Growers, and Diamond Walnut Growers Association. Its purpose is to explore areas of mutual interest among the member groups such as consolidation of carloads, interchange of storage facilities, new products research, and procurement of supplies. It is chartered with broad powers, enabling it to carry out almost any activity its members may deem of mutual benefit.

Cooperative purchase of container and packaging supplies by Consolidated Agriculture Industries, however, may not have the potential for savings as manufacture of containers. Each member of the association already buys in large quantities and the type of containers each uses varies considerably.

Cooperative Manufacture.--The cooperative manufacture or fabrication of containers in California would be facilitated through large federations of cooperatives having sufficient volume of operations to justify the required investment in plants. Perhaps the greatest opportunity for further cooperative manufacture of metal cans or the fabrication of corrugated cardboard cartons exists under the leadership of an organization such as Consolidated Agriculture Industries.

Cooperative manufacture of containers in California, however, would face active competition from large, well-established container manufacturers. The total volume of fruits and vegetables processed in California is large enough that these companies have located container manufacturing plants in principal producing areas throughout the State, and have provided effective sales forces and warehouse systems to serve their customers. Cooperatives reported that major manufacturers also support active programs of research and development, offer complete service at competitive prices, and maintain locally available inventories for the convenience of processors.

FLORIDA

Processors of canned citrus fruit and vegetables are concentrated almost entirely in Florida. This State produces virtually all of the Nation's canned citrus fruit and 95 percent of the canned citrus juice. Personal interviews were conducted with Winter Garden Citrus Products Cooperative, Winter Garden; Plymouth Citrus Products Cooperative, Plymouth; Florida Citrus Cannery Cooperative, Lake Wales; Golden Gem Growers, Inc., Umatilla; B & W Canning Company, Inc., Groveland; Cypress Gardens Citrus Products Cooperative, Winter Haven; and with one other processing company. Also interviewed was Citrus Central, Inc., Winter Park, Fla., an organization consisting of five cooperative processors.

Cooperative procurement of containers and packaging supplies in Florida is providing

some growers with substantial savings. Further opportunities appear available.

Cooperative Purchase.--Opportunities for cooperative purchase of containers for processed citrus products, including frozen orange juice concentrate, canned single-strength orange juice and sections, and chilled orange juice appear to be limited to non-standard items that are used in low volume by several processors. Such items would include various sizes of cans and related corrugated cases, packaging supplies, and possibly labels. The advantages for cooperative purchase of labels, however, may be offset by the amount of coordination required to consolidate the many sizes.

Established purchasing arrangements and the volume of the individual accounts would seem to preclude any substantial savings through cooperative buying of high-volume items such as standard-size cans and corrugated cases.

Cooperative Manufacture.--Substantial opportunities for cooperative manufacture of containers, especially metal cans, appear to exist in the citrus processing area. While one cooperative at Winter Garden has realized savings for growers through its small can-manufacturing plant, the most feasible opportunity would appear to be through a federation of cooperatives such as Citrus Central, Inc., Winter Park, Fla.

Citrus Central, Inc., was chartered under the Florida Agriculture Act in 1965. It is owned by five cooperative processors in that area, three of which produce a full line of citrus products, including frozen orange juice concentrate, canned single-strength juices and sections, and chilled juice. One organization produces only frozen orange juice concentrates. Total sales of the five organizations for 1966 were approximately \$90 million.

The purpose of Citrus Central is to explore areas of mutual interest among the member groups in areas such as centralized marketing, advertising, product research and product

development, and procurement of supplies. The cooperative is chartered with broad powers, enabling it to engage in any activity its members deem suitable.

At the time of interview, Citrus Central was considering establishing a can-manufacturing plant within a year and was studying the feasibility of fabricating corrugated cardboard cases within 2 to 3 years.

Most commonly used metal cans used by members are No. 404(46 oz.); 6 oz.; No. 307(24 oz.); and No. 303.

The remainder of the cans used are of various sizes and constitute only a small percentage of the total volume, but may represent an opportunity for cooperative purchase.

Major critical factors to be considered are research and development and storage of containers during the off-season. Other considerations include determining the best type of organization and structure, getting the cooperation of all member groups, and developing a profitable line of cans which would have sufficient volume and stability to run for several years.

Total volume of corrugated cardboard used by the member organizations of Citrus Central is equivalent to 250 million board feet, for about 30 million can cases. In addition, member groups use about 5 million telescoping cartons for fresh fruit. The opportunity for fabricating corrugated cartons would require investigation.

The cardboard industry is very competitive and requires substantial capital investment. Some managers believed that to compete in the corrugated cardboard field, one would have to get into the actual manufacture of paper and perhaps integrate the suppliers of wood pulp. However, cooperative plants fabricating paperboard containers (such as those of Fruit Growers Supply Company, Los Angeles, Calif., and Northwest Wholesale, Inc., Wenatchee, Wash.) are operating successfully under contractual arrangements with container companies manufacturing basic materials.

NORTHWESTERN AREA

Washington and Oregon produced a total of 51.8 million cases of canned vegetables, non-citrus fruits, and juices in 1965, or about 13 percent of the U.S. total. Nearly half of the U.S. total of noncitrus fruit juices are processed in these two States. Cooperative processors tend to be concentrated in two general areas. In the Yakima Valley in Washington, representative associations were: Tree Top, Inc., Silah--apple juice, and Blue Ribbon Growers, Yakima--mixed fruit and vegetables. The second group was located with a 60 to 80-mile radius of Portland, Oreg. Representatives of the larger processors interviewed were: Washington Cannery Cooperative, Vancouver, Wash.; Blue Lake Packers, Salem, Oreg.; Diamond Fruit Growers, Hood River, Oreg.; United Growers, Inc., Salem, Oreg.; and Eugene Fruit Growers Association, Eugene, Oreg. This group normally processed a mixed line of deciduous fruits and vegetables; sales ranged from \$6 million to \$13 million per processor in 1965.

Six cooperatives in the metropolitan area of Portland, Oreg., each reported sales of over \$2.5 million in 1965. Two other processors located within a 200-mile radius reported sales in this category. Total sales for this group were approximately \$55 million in 1965. With one exception, all of the processors canned both fruits and vegetables; one reported handling vegetables only. Some fruits (especially berries) and vegetables are frozen, but the bulk of the volume is canned.

Seven other cooperatives contacted in the area each had sales of less than \$2.5 million. These cooperatives engaged in more specialized activities such as freezing, drying, or institutional packing.

Cooperative Purchase.--Processors generally believed there were only limited opportunities or no apparent advantage for cooperative purchase of containers and packaging supplies in the Northwestern area. Either they were large enough that they could purchase as cheaply as a purchasing agency, or

the containers used were so specialized that there would be little opportunity to consolidate purchases.

Cooperative Manufacture.--Processors in the Portland, Oreg., area were considering cooperative manufacture of metal cans in 1966. Preliminary investigation revealed these processors had sufficient volume to support a can-manufacturing plant.

Volume is a necessary criterion but should not be considered the only important one for cooperative manufacture. Consideration must be given to the problem of coordination. Presently there is no central organization in the Northwest to take the initiative and provide an organization for the establishment of a can plant. The task of coordination among interested groups is difficult and will require considerable effort.

The eight cooperative processors in the Northwestern States with individual sales of over \$2.5 million indicated purchases of metal cans totaling about \$9 million. Although many different sizes of cans are used, most of those reported consist of four main types. Four of the processors provided the following detailed figures on the number and types of cans used:

<u>Type</u>	<u>Number used</u>
8 oz.	20 million
303 x 406	67 million
401 x 411	6 million
603 x 700	12 million
Other	2.5 million

Variations exist within each basic type, such as plain finish, enamel finish, and weights of material varying from about 60 pounds to 112 pounds. These factors would also have to be considered in developing sufficient volume for a profitable line.

Research and development costs, the competitive structure of the can industry, and transportation costs would all have to be given further consideration in a detailed analysis.

NORTHEASTERN STATES

Production of canned fruits, vegetables, and juices in New York, Pennsylvania, and Michigan accounted for approximately 10 percent of the U.S. total. The most important products in Michigan and New York are canned fruit and canned fruit juices. New York also processes a substantial amount of canned vegetables, mainly in the northeastern part of the State. The larger cooperative processors interviewed were National Grape Cooperative, Westfield, N.Y.--grape juice; Pro-Fac Cooperative, Inc., Rochester, N.Y.--mixed fruit and vegetables; Berks-Lehigh Fruit Growers Cooperative, Fleetwood, Pa.--deciduous fruits; Cherry Growers, Inc., Traverse City, Mich.--cherries; and Great Lakes Mushroom Cooperative, Warren, Mich.--mushrooms.

Cooperative action for the procurement of containers and packaging supplies in New York, Pennsylvania, and Michigan has some definite limitations.

Cooperative Purchase.--Conditions favorable to cooperative purchase, such as a large number of firms processing similar or identical products within a small geographical area, are limited. In areas where firms produce a substantial amount of a similar product, such as cherries in Michigan or grapes in New York, the cooperatives are of sufficient size that it is doubtful whether any substantial advantage would be gained through consolidating container purchases.

Cherry Growers, Inc., Traverse City, Mich., is the only cooperative processor of cherries in that area. National Grape Cooperative's sales of grape juice and grape products were approximately \$60 million in 1965. The only other grape cooperative processes and ships in bulk containers only, and its sales are only about \$500,000 a year.

The principal cooperative processor of vegetables is Pro-Fac Cooperative, Inc., Rochester, N.Y., with sales of \$25 million. For such cooperatives, opportunities for cooperative purchasing would be limited.

Aggregation of purchases is not feasible for smaller processing cooperatives located throughout the area because these cooperatives are either geographically separated from each other or do not process a similar type of product.

Cooperative Manufacture.--Manufacture of metal cans or fabrication of corrugated cartons appears to offer the greatest opportunity to a

large cooperative processor such as National Grape or Pro-Fac. Some consideration has been given to can manufacture by Pro-Fac, but little opportunity was seen by the management of National Grape because of the specialized types of containers used for grape juice and grape products and existing purchasing arrangements. The latter indicated, however, that an opportunity for savings may exist in the fabrication of corrugated cardboard containers.

Suggestions

Based on opportunities existing among cooperative fruit and vegetable processors for the cooperative procurement of containers and other packaging supplies, the following suggestions are offered to directors and managers:

Manufacturing

Opportunities for the cooperative manufacture of containers are greatest in the fabrication of metal cans and corrugated paper-board shipping cases.

1. Can Manufacture

a. A minimum volume of approximately 40 to 50 million cans for commonly used sizes, such as 12-ounce or Nos. 202, 303, and 401, is necessary to ensure profitable operation. For 46-ounce or 1-gallon sizes, a volume of 10 to 12 million cans would be needed. Possibly 30 million made up of mixed sizes would be required.

b. Only those can types and sizes packed in greatest volume should be fabricated. Other sizes and types should be purchased direct from major manufacturers.

c. Because of the year-to-year variation in volume of fruits and vegetables packed, the cooperative can plant should be designed to manufacture at a level below total estimated member requirements and should be planned for multishift operations when required. Can requirements beyond manufacturing capacity should be purchased direct from manufacturers.

d. The can-manufacturing season should be extended as much as possible by encouraging member cooperatives to accept and store cans in off-season months. Off-season discounts or storage allowances may be necessary to induce these purchases. The can plant itself should maintain only minimum inventories of completed cans.

e. Cans should be priced to members at industry list prices minus normal discounts for prompt payment.

f. Possibilities of leasing can-manufacturing equipment from metals suppliers should be explored.

g. Membership patronage should be assured through self-renewing purchasing contracts.

2. Paperboard Carton Fabrication

- a. Fabrication of paperboard cartons by cooperative fruit and vegetable processors should be limited to simple carton forming and printing.
- b. Fabrication should be limited to types of standard containers, e.g., can cases, used in greatest volume.
- c. Number of cartons fabricated should be below normal annual member requirements to permit operation of the carton plant at full capacity.
- d. Precut, scored paperboard carton blanks should be purchased from major paperboard manufacturers on an annual, negotiated-price basis.
- e. Only operating inventories of completed cartons should be maintained. Member processors should be encouraged to make off-season purchases and to provide warehousing in existing processing plant buildings.
- f. Membership patronage should be assured through self-renewing purchasing contracts.

Purchasing

1. A cooperative purchasing association should undertake only simple brokerage operations.
2. Contracts should be negotiated for volume or brokerage discounts on the most

favorable terms consistent with container quality and service required.

3. Specific container standards and specifications, including delivery and credit terms, should be developed for use in contract negotiations.
4. The cooperative should endeavor to service member needs for all major types of containers required. Cooperative purchase of other processing and plant supplies can be offered as the need and opportunities dictate.
5. The cooperative should perform all necessary functions of price negotiations, ordering for members, and collection from members, but it should not purchase items for its own account, maintain inventories of containers or other supplies, or assume responsibility for accounts of its members.
6. All shipments from suppliers to processors should be "drop shipments" made directly from the manufacturer to the processor.
7. Bills from the cooperative to its members should be discounted for prompt payment, but all brokerage fees or other discounts below usual industry list prices should be retained as operating revenue. Then net revenue above operating costs should be refunded to members as annual patronage refunds.
8. The supply cooperative need not maintain a sales force, but the manager or fieldmen, as required, should visit member processors to assist them with their supply-procurement problems.

Appendix

Table 1.--Advantages of purchasing containers and packaging supplies direct from manufacturers reported by fruit and vegetable processing cooperatives, 1965

Advantage	Number of times mentioned	Percent of total
Price factors:		
Lowest price.....	16	14.9
Can get discount.....	3	2.8
National can company has a plant here - freight savings.....	2	1.9
Good credit terms.....	1	.9
Obtain list price.....	2	1.9
More competitive pricing.....	2	1.9
Total.....	26	24.3
Service factors:		
Good service.....	16	15.0
Dependability.....	3	2.8
Get the type of service needed and demanded.....	3	2.8
Can deal directly with the manufacturer on specifications and other problems.....	3	2.8
Good delivery service.....	7	6.6
Service on equipment is good.....	2	1.9
Helped with layout and design of equipment.....	1	.9
Plant location.....	7	6.6
Supplier keeps adequate stock so inventory can be kept low.....	4	3.7
Favorable terms.....	1	.9
Lower inventory required.....	1	.9
Total.....	48	44.9
Quality factors:		
Quality product.....	11	10.4
Product guarantee.....	2	1.9
Most advanced product.....	1	.9
Quality control.....	2	1.9
Research and development activities by manufacturer most important.....	1	.9
Work closely with manufacturer to obtain specialized container.....	1	.9
Quality specifications.....	1	.9
Manufacturer tests material.....	1	.9
Total.....	20	18.7
Other factors:		
Historical pattern.....	3	2.8
Only source available.....	10	9.3
Total.....	13	12.1

Table 2.--Examples of prices paid for metal cans by fruit and vegetable processing cooperatives, 1965

Container and type	Can size	Net cost per thousand ¹			
		High	Low	Variation	Average
----- Dollars -----					
6-oz. juice	¹ 202 x 314	27.24	19.04	8.20	24.43
6-oz. juice..... plain ..	211 x 204	26.29	25.00	1.29	25.59
6-oz. juice..... litho ..	211 x 204	26.82	26.06	.76	26.44
6-oz. juice..... plain ..	211 x 212	25.14	23.46	1.68	24.58
6-oz. juice..... litho ..	211 x 212	28.47	28.47	.00	28.47
8-oz. tall	¹ 211 x 304	26.12	20.68	5.44	24.18
No. 1 (picnic).....	211 x 400	28.94	28.91	.03	28.93
12-oz. juice	211 x 414	32.19	30.45	1.74	31.32
8-oz. mushroom..... plain ..	300 x 400	32.42	30.24	2.18	31.33
8-oz. mushroom..... litho ..	330 x 400	38.10	38.10	.00	38.10
No. 300..... plain ..	300 x 407	31.73	30.24	1.49	30.98
No. 300..... litho ..	300 x 407	36.82	36.82	.00	36.82
No. 303.....	¹ 303 x 406	36.26	26.96	9.30	32.37
No. 2	307 x 409	41.31	38.09	3.22	38.88
No. 2	307 x 509	47.40	47.35	.05	47.38
24-oz. juice	307 x 510	44.88	44.44	.44	44.66
29-oz. juice	307 x 700	67.32	67.32	.00	67.32
No. 2 1/2.....	¹ 401 x 411	51.60	43.56	8.04	48.45
46-oz. juice..... plain ..	¹ 404 x 700	84.89	76.87	8.02	80.33
46-oz. juice..... litho ..	404 x 700	88.30	87.42	.88	88.03
46-oz. juice.....	603 x 600	132.95	130.68	2.27	131.83
No. 10.....	¹ 603 x 700	138.24	105.04	33.20	124.90
6 1/2	--	138.71	137.40	1.31	138.05
No. 30..... frozen tin ..	--	495.00	325.63	169.37	414.59
10-oz. composite cans with metal ends ..	--	24.75	21.60	3.15	22.92
16-oz. composite cans with metal ends ..	--	28.68	28.68	.00	28.68

¹ Most commonly reported types and sizes used.

Table 3.--Examples of prices paid for glass containers by fruit and vegetable processing cooperatives, 1965

Container size	Net cost per gross ¹			
	High	Low	Variation	Average
----- Dollars -----				
4-oz.	11.92	11.92	.00	11.92
12-oz.	8.58	7.97	.61	8.27
15-oz.	5.17	4.86	.31	5.07
25-oz.	6.71	6.64	.07	6.68
32-oz. (amber bottle)	8.67	8.58	.09	8.64
35-oz.	7.39	6.95	.44	7.17
36-oz.	8.64	8.64	.00	8.64
Various size wine bottles, per case	--	--	--	1.00

¹ Net cost includes the corrugated cardboard cases.

Table 4.--Examples of prices paid for corrugated cardboard cannery cases by fruit and vegetable processing cooperatives, 1965

Number of cans per case	Container size	Net cost per thousand ¹			
		High	Low	Variation	Average
----- Dollars -----					
48.....	² 6-oz.	78.96	57.90	21.06	64.24
24.....	² 8-oz.	72.00	55.95	16.05	61.38
24.....	8-oz. tall	98.28	98.28	.00	98.28
48.....	8-oz.	78.75	78.75	.00	78.75
24.....	10-oz.	55.01	51.29	3.72	53.15
24.....	12-oz.	69.99	69.64	.35	60.82
24.....	² No. 303	73.11	58.81	14.30	66.31
12.....	No. 303	50.62	50.62	.00	50.62
12.....	No. 2	62.68	59.63	3.05	61.16
12.....	² No. 2-1/2	81.55	79.47	2.08	80.51
24.....	² No. 2-1/2	113.03	106.80	6.23	109.91
6.....	² No. 10	142.40	94.05	48.35	106.31

¹ After discounts ranging from 1% for cash to 5% + 5% + 5% + 1%.

² Most commonly used types and sizes.

Table 5.--Examples of prices paid for industrial containers and packaging supplies by fruit and vegetable processing cooperatives, 1965

Container description	Net cost per unit or thousand			
	High	Low	Variation	Average
----- Dollars -----				
50-gal. reconditioned drums, each.....	5.60	5.00	.60	5.30
55-gal. steel drum, each.....	7.93	--	--	7.93
4' x 4' x 4' wood bins, each ¹	15.00	--	--	15.00
4' x 4' x 4' plywood bins, each ¹	21.00	--	--	21.00
Fiber cases 50-lb. frozen No. 55/M.....	131.40	--	--	131.40
Fiber case 30-lb. fig/M.....	112.00	--	--	112.00
Fiber case 80-lb. fig/M.....	146.34	--	--	146.34
Poly liner 30-lb. fig/M.....	19.00	--	--	19.00
Poly liner 80-lb. fig/M.....	35.00	--	--	35.00
Fiber case 30-lb. bulk.....	115.85	--	--	115.85

¹ Used for bulk handling of processed pickling cucumbers.

Table 6.--Examples of prices paid for various consumer packages by fruit and vegetable processing cooperatives, 1965

Consumer package description	Reported price
	<u>Dollars</u>
Cello bag for figs 11-oz. per M	130.00
Cello bag for figs 8-oz. per M.	75.00
Bag case for figs per M	100.00
10-oz. cardboard frozen food container, 5-1/4 x 4 x 1-7/8, solid bleached sulfate	7.04
Master carton for 24 10-oz. frozen food containers, 16-1/4 x 8-1/4 x 6, quadlock, No. 125	51.80

Table 7.--Examples of prices paid for labels and other packaging supplies by fruit and vegetable processing cooperatives, 1965

Labels and other supplies	Net cost per thousand			
	High	Low	Variation	Average
Labels for metal containers:	<u>Dollars</u>			
No. 1 (picnic)	--	--	--	2.79
No. 303	--	--	--	3.65
No. 2-1/2.	--	--	--	4.64
No. 5.	--	--	--	6.82
No. 10.	--	--	--	9.14
12-oz.	--	--	--	3.40
8-oz.	--	--	--	2.30
Other	9.00	2.40	6.60	5.46
Labels for 1-oz. composite cans	3.33	3.33	.00	3.33
Labels for wine bottles.	9.00	4.60	4.40	6.20
Aluminum closures	9.00	8.10	.90	8.55

Other FCS Publications Available

Supply Cooperatives. Bulletin Reprint 2. J. Warren Mather and Staff.

Cooperative Bargaining for Feed and Farm Supplies in Illinois, 1959-64. General Report 136, R. J. Mutti and L. J. McGinnis.

Collective Bargaining for Poultry Feed Prices--California. General Report 141, D. B. DeLoach and J. A. Maetzold.

Mobile Feed Milling by Cooperatives in the Northeast. General Report 99, Theodore R. Eichers and Arno J. Hansas.

Cooperative Bulk Fertilizer Blending in the Upper Midwest. General Report 122, Theodore R. Eichers.

Handbook on Major Regional Cooperatives Handling Supplies, 1964 and 1965. General Report 140, J. Warren Mather.

Credit Control in Selected Retail Farm Supply Cooperatives, Area VI, New York, New Jersey, Virginia, West Virginia, North Carolina, and Georgia. General Report 70, John M. Bailey.

Improving Management of Farmer Cooperatives. General Report 120, Milton L. Manuel.

Regional Cooperative Handling Under \$10 Million of Supplies, 1960-61. General Report 115, J. Warren Mather and Anne L. Gessner.

Statistics of Farmer Cooperatives, 1963-64. General Report 134, Bruce L. Swanson.

Approaches and Problems in Merging Cooperatives. Information 54, Martin A. Abrahamsen and J. Warren Mather.

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