Fresh Fruit and Vegetable Prepackaging

Northeastern Region

OPERATING SEASON-1954-55

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FOREWORD

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This report represents part of a nationwide survey of fresh produce packaging plants. It covers plants located in the Northeastern States. It is planned to publish a final report which will cover packaging plants in all areas of the United States.

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CONTENTS

	Page
Summary	iv
Introduction	1
Operating practices	2
Season	2
Commodities packaged	2
Packaging methods and equipment	3
Packaging and sealing materials	3
Refrigeration	4
Commodity distribution	4
Operating characteristics of packaging plants, Northeastern States, 1954-55	4
Apples	5
Beans, green	6
Beets	7
Beet greens and collards	8
Brussels sprouts	11
Carrots	12
Celery	14
Cole slaw and tossed salad	16
Dandelions, chicory, and escarole	19
Garlic	23
Grapefruit	24
Kale	25
Lettuce	27
Onions (dry)	28
Oranges	29
Parsnips	30
Potatoes	32
Radishes	34
Soup mix	36
Spinach	38
Turnips	40
General information on commodities reported packaged by only one plant	41
Blueberries	41
Lemons	41
Mushrooms	41
Mustard greens	42
Parsley	42
Diced rutabagas	42
Squash	42
Turnip tops	42
General information - 1954-55 season	43

SUMMARY

Many fresh commodities are now prepackaged, either on a volume or an experimental basis, especially commodities to which prepackaging gives protection from bruising, preservation of quality, sanitation, consumer appeal, and consumer convenience. In the retail stores in the Northeastern area, some commodities are primarily marketed in packaged form. Others are marketed primarily in bulk form. However, many packagers are experimenting with new methods for those commodities which lend themselves to packaging and are not yet extensively packaged.

The current trend seems to indicate that packaging will be the accepted future method of marketing items of fresh produce which are adapted to packaging. It seems to be primarily a matter of time in finding a suitable package at an acceptable price.

Where packaging should be done is still a controversial issue. At the present time it is done to some extent at all levels: by the producer, the centralized packaging plant, the service wholesale house, and the retail store. The central point packaging plant, however, is probably the main packager in the Northeastern area. Some retailers are experimenting with completely prepackaged fresh produce in self-service departments, produce being packaged at the retail store level; other retailers are displaying combinations of packaged and bulk produce. Many service wholesalers are now packaging; some of them are installing packaging lines in their most strategically located branch houses.

Prepackaging is an added service which is in great demand at the present time, particularly at the retail store level. Where it will be done in the future may well depend on the packaged life of the commodity and where the packaging service can be performed most effectively and efficiently.

Many plant operators feel that packaging is progressing at such an accelerated rate that methods and machinery and equipment in use are quickly obsolete, giving way to new and more efficient machinery and processing methods. Plant operators are constantly looking for new ways of processing commodities, and experimenting with new methods and equipment.

Increased demand for packaged commodities stems in part from benefits realized at different marketing and distribution levels. At the wholesale level, these benefits may be in the form of increased efficiency and decreased cost in handling, storage, and shipping, and less spoilage; at the retail level, longer shelf life with decreased waste and spoilage, increased merchandising efficiency, and decreased cost in handling, storage, and display; at the consumer level, added convenience in shopping and home refrigeration, a more sanitized product, decreased kitchen spoilage and waste, and a product of more uniform grade and quality.

Although the plants surveyed were most diverse in operating methods and practices, there was noticeable uniformity among plants by commodity for such factors as size and type of consumer and master containers, length of processing season in any particular area, percentage of packaging loss and shrinkage, and cost of packaging materials and direct labor.

Although fresh produce is widely packaged, of the approximately 100 fresh fruits and vegetables marketed, only about 30 were packaged by the plants surveyed. Vegetables are more generally packaged than fruits.

FRESH FRUIT AND VEGETABLE PREPACKAGING, NORTHEASTERN REGION, OPERATING SEASON -- 1954-55

By Thomas B. Smith and John W. Browning, agricultural economists, Transportation and Facilities Branch, Agricultural Marketing Service

INTRODUCTION

The packaging of fresh fruits and vegetables in consumer units is expanding, although only about 20 percent of the fresh produce is now packaged before reaching the retail level. Approximately 56 billion pounds of fresh fruits and vegetables are marketed annually and about 11 billion pounds are packaged in unit containers. Shippers, packers, and distributors of fresh fruits and vegetables consequently need more information on the growth of the produce prepackaging industry.

Potential packagers want to know what commodities are being prepackaged, what types and sizes of packages are used, what types of machinery and equipment are used, and what experimental methods are being tested. Firms already in the business also want such information to help them expand operations.

A nationwide survey of fresh produce packaging plants is being made to obtain information on the present status of fruit and vegetable prepackaging. This is a preliminary report covering plants in the Northeastern States. A total of 58 firms were surveyed--an estimated two-thirds of the northeastern produce packaging plants which package more than one commodity. Retail store prepackaging operations were not covered. States included in this part of the survey are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia. The personal-interview questionnaire method was used. In most instances, the owner or plant manager provided the data. Usually the schedule was completed on one visit, though in some instances a number of visits were made.

Information on commodities handled, and also on amounts of finished products, was obtained readily. However, information on the steps in the packaging operation and data on machinery and equipment costs were much more difficult to obtain. The machinery and equipment in some plants were dismantled for repair and painting at the time of the interview. Much of the machinery was of special design. It was difficult to arrive at values. The low and high range is shown only for items for which figures from 3 or more plants were obtained. Much of the descriptive data are fragmentary and should be used only as a rough guide.

Produce prepackaging plants covered in this study were organizations generally engaged in packaging operations for the purpose of supplying wholesalers, chain and independent retail stores with cleaned, graded, and packaged fresh produce. Their primary functions were to assemble fresh fruits and vegetables from various sources, to package them in consumer-size units (units ordinarily purchased by consumers) and to distribute this produce through wholesale and retail trade channels. Distribution was not necessarily confined to the specific area of the plant's location but often went beyond State boundaries.

This survey did not cover plants which specialized in packaging exclusively tomatoes, mushrooms, cranberries, blueberries, potatoes, or citrus. Previous surveys have been made on the packaging of potatoes, citrus, cranberries, and tomatoes.

OPERATING PRACTICES

Season

The operating season most frequently reported by commercial prepackagers in the Northeastern region extended from September 1954 through August 1955, with length of season ranging from 2 to 12 months. Many prepackagers curtailed packing operations during the summer months primarily because of the deteriorative effect of high temperatures on fresh vegetables, particularly the leafy types. Consequently, September to June was the most active prepackaging season. When leafy vegetables such as spinach and kale were packaged during the summer, many prepackagers placed chipped ice in the master container during delivery to customers. The chipped ice was placed in the container loose or in bags lined with polyethylene.

Commodities Packaged

In the Northeastern region about 30 different vegetables were prepackaged, including spinach, kale, beet greens, onions, collards, mustard, turnip tops, beet roots, turnip roots, lettuce, brussels sprouts, parsnips, celery, carrots, radishes, mushrooms, squash, beans, chicory, escarole, rutabagas, parsley, garlic, and dandelion greens. There were also 5 different fruits--apples, oranges, lemons, grapefruit, and blueberries. In addition, soup mix, salad mix, tossed salad, and cole slaw were prepackaged.

Some plants prepackaged only one commodity, whereas others prepackaged as many as 15. There was great variation in the quantity of the different commodities packed by a particular plant. Of the vegetables, kale, celery, carrots, radishes, and spinach were among the most important in volume of pack. Among the fruits, apples and oranges were of major importance.

Plants continually experiment with new methods of packing, new types and sizes of containers, new machinery, and new commodities. Some of the commodities which are still mainly in the experimental packaging stages are cut squash, diced carrots, diced turnips, rutabagas, beans, peeled cut potatoes, and sweet corn. In addition, there have been some experiments with 20-ounce bags of spinach.

Packaging Methods and Equipment

Leafy vegetables of the type used primarily for *greens*, such as spinach, kale, and dandelions, usually require more attention in packaging than root-type vegetables or fruits, excluding berries. Some plants wash leafy vegetables 3 or more times and inspect them 2 or more times before they reach the packing line. Many of the operations, such as washing, grading, and drying, are mechanized, but the inspection and packing are primarily manual. Some plants in the region have experimented with an automatic bagging machine for spinach and kale, but no plants had such a machine in active operation.

One of the most completely automatic processes was with root-type vegetables such as radishes, turnips, onions, and beets. The bag was fabricated by a machine and the commodity was automatically weighed, bagged, and sealed. Another was an automatic packing machine for lettuce. One popular operation was the use of a semiautomatic machine for radishes and fruit in which the weighing and filling of the bag were mechanically controlled. Some commodities such as garlic, soup mix, and parchment-wrapped celery hearts were almost entirely packaged by hand.

Nearly every plant showed considerable individuality in the type of machinery used and in job performance. Much of the machinery, especially washers and dryers, was developed or custom-made according to the packager's specifications. There was substantial variation, therefore, in the type of machinery used. In addition, there was variation in manual operations. For example, in some plants the bag was filled with spinach and weighed by the same person. In other plants, one person filled the bag and a second person weighed it. In still others, the spinach was weighed before it was put into the bag.

Packaging and Sealing Materials

There was considerable uniformity among plants in sizes and types of packages used for many of the leafy-type and root vegetables. Certain other vegetables, including celery and lettuce, were put up in packages of different types and sizes. Lack of uniformity was most evident in the packaging of those vegetables still in an experimental stage. Semimoisture-proof cellophane was the material most often used for consumer packages of leafy vegetables. Ordinarily the closure was made by heat-sealing. Polyethylene was most frequently used for packaging root-type vegetables and fruits when the net content was more than 16 ounces. The mesh bag and fiberboard tray were of secondary importance in fruits, with the exception of grapefruit, for which the mesh bag was generally used.

There was considerable variation in types of closures. They included wire staples, twist'ems, quik-loks, and heat-sealing.

Maximum visibility of the contents, but with enough package design and color to maintain brand identity, was the policy followed by most plants.

The type of master containers most often used were of new fiberboard material designed for the particular commodity.

Refrigeration

Adequate refrigeration was considered by most prepackagers to be the most important factor in successful prepackaging. Most plants have two or more cold storage rooms. Many plants precool the leafy-type vegetables before prepackaging. Refrigeration is desirable after packaging and throughout the distribution channels.

Commodity Distribution

The leading distribution route was direct from the packager to chain retail stores. Most plants distributed some packaged products to chain retail stores and in some instances all products went to chains. Only slightly less important in distribution were independent stores and wholesalers; jobbers were of minor importance. Approximately three-fourths of the total output of the plants was distributed within a radius of 50 miles. The balance of the output was distributed about equally to markets at distances of 50 to 99 miles and 100 miles and over.

OPERATING CHARACTERISTICS OF PACKAGING PLANTS, NORTHEASTERN STATES, 1954-55

Selected operating characteristics of produce packaging plants surveyed in the Northeastern States are shown by commodity. The operating season usually began in September and ended in August.

APPLES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	4
Maximum packing season	Sept.-June
Usual packing season	Sept.-May
Total production:	
Consumer packages	1.4 million
Pounds	5.0 million
Shipping containers for bulk apples:	
Usual type	Field crate
Average net weight	40 pounds
Other type	Bushel basket
Average net weight	50 pounds
Shrinkage, trim, and unusable part:	
Average	13 percent
Range	3-25 percent

CONSUMER PACKAGE:

Type:	
Usual type	Polyethylene bag
Size--net content	3-4-5 pounds
Average cost per 1,000:	
3 pounds	$12
4 pounds	18
5 pounds	16

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	8
Range	8-12
Cost per container:	
Average	$0.29
Range	$0.23-0.32

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	11
Range	7-18
Consumer packages per hour:	
Average	853
Range	360-1,200
Master containers packed per hour:	
Average	93
Range	30-150
Labor cost per consumer package:	
Average	$0.02
Range	$0.01-0.036

PACKAGING OPERATIONS AT 4 PLANTS:

Manually dump apples on conveyor belt for inspection and sorting	3 plants
No information	1 plant
Sizing and grading:	
Performed mechanically	1 plant
Performed manually	2 plants
No information	1 plant
Packing:	
Packer places apples in bag and weighs each bag	3 plants
No information	1 plant
Closing:	
Mechanically, with tape	2 plants
Manually, with tape	1 plant
No information	1 plant

COST OF MACHINERY AND EQUIPMENT:

Scales (over-and-under):	
Average	$140
Range	$100-180
Sealer (tape):	
Average	$22

BEANS, GREEN

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	2
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-July
Total production:	
Consumer packages	.1 million
Pounds	.075 million
Shipping containers for bulk beans:	
Usual type	Bushel-hamper
Average net weight	27 pounds
Shrinkage, trim, and unusable parts:	
Average	19 percent
Range	10-27 percent

CONSUMER PACKAGE:

Usual type	Tray overwrapped with 450-gage semimoisture-proof cellophane
Size--net content	12 ounces
Cost per 1,000 trays:	
Average (cellophane cost not available)	$10.90
Range	$9.80-12.00

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	6
Cost per container:	
Average	$0.035
Range	$0.03-0.041

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	7
Range	5-8
Consumer packages per hour:	
Average	660
Range	600-720
Labor cost per consumer package:	
Average	$0.01

PACKAGING OPERATIONS AT 2 PLANTS:

Methods:	
Inspect and sort	2 plants
Wash	2 plants
Water extraction:	
Drain	2 plants
Mechanically snip ends	2 plants
Mechanically cut	2 plants
Manually pack and weigh	2 plants

AVERAGE COST OF MACHINERY AND EQUIPMENT:

Conveyor belts	$1,000
Packing and trimming table	$1,150
Bean snipper	$2,000
Bean cutter	$1,000
Washing-pressurized water spray, including cost of entire processing line	$15,000
Heat sealer	$1,000
Stapler for master carton	$405
Refrigeration	$10,000

BEETS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	10
Maximum packing season	Sept.-Aug.
Usual packing season	Oct.-June
Total production:	
Consumer packages	2.0 million
Pounds	1.7 million
Shipping containers for beets:	
Usual type	Bushel bag
Average net weight	50 pounds
Other type	Crates
Average weight	75 pounds
Shrinkage, trim, and unusable portion:	
Average	7 percent
Range	1-20 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Mesh bag
Size--net contents	1 pound
Cost per 1,000:	
Average	$14
Range	$10-16

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	12
Range	6-24
Cost per container:	
Average	$0.11
Range	$0.07-0.15

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	14
Range	7-32
Consumer packages per hour:	
Average	1,600
Range	600-3,000
Labor cost per consumer package:	
Average	$0.01
Range	$0.005-0.017

PACKAGING OPERATIONS AT 10 PLANTS:

Inspection and sorting:	
After washing	5 plants
No information	5 plants
Washing:	
Barrel type tumble washer for root vegetables	3 plants
Pressurized water spray system	2 plants
No information	5 plants
Water extraction:	
Drain on table	5 plants
No information	5 plants
Packing:	
Semiautomatic weighing and bagging	1 plant
Automatic weighing and bagging	1 plant
No information	8 plants
Closing:	
Staple	2 plants
Tape	2 plants
Twist'ems	1 plant
No information	5 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection and sorting table:	
Average	$1,500
Washer:	
Barrel type:	
Average	$400
Pressurized water sprays:	
Average	$6,500
Range	$2,000-$15,000
Wire stapler:	
Average	$150
Tape dispenser:	
Average	$25
Carton stapler:	
Average	$538
Range	$300-650
Garbage disposal unit:	
Average	$3,500

BEET GREENS AND COLLARDS

1954-55 Season

Item	Beet greens	Collards
GENERAL INFORMATION:		
Plants surveyed	16	2
Maximum packing season	Sept.-Aug.	Sept.-Aug.
Usual packing season	Sept.-June	Sept.-June
Total production:		
Consumer packages	3 million	0.2 million
Pounds	1.8 million	0.2 million
Shipping containers for bulk beet greens and collards:		
Usual type	Bushel basket	Bushel basket
Average net weight	20 pounds	20 pounds
Shrinkage, trim, and unusuable part:		
Average	10 percent	10 percent
Range	3-15 percent	5-15 percent
CONSUMER PACKAGE:		
Usual type	Film bag--300-gage semi-moisture-proof cellophane	Film bag--300-gage semi-moisture-proof cellophane
Other type	Film bag--450-gage semi-moisture-proof cellophane and polyethylene	Polyethylene bag
Size--net content	10 ounces	10-20 ounces
Cost per 1,000:		
Average	$14	$18
Range	$8-17	$15-20
MASTER CONTAINERS:		
Type:		
Usual	Fiberboard	Fiberboard
Other	Wood crate	Wood crate
Consumer packages per container.		
Usual	12	12
Range	6-12	6-12
Cost per container:		
Average	$0.11	$0.13
Range	$0.08-0.15	$0.11-0.15
Cost of ice bag used in master containers:		
Average	$0.02	$0.02
Range	$0.01-0.04	-
Cost of ice per bag:		
Average	$0.01	$0.02

BEET GREENS AND COLLARDS (Continued)

1954-55 Season

Item	Beet greens	Collards
PRODUCTION RATES AND DIRECT LABOR COST:		
Workers in processing line:		
Average	15	19
Range	4-32	7-42
Consumer packages per hour:		
Average	1,222	1,400
Range	320-2,760	600-2,400
Labor cost per consumer package:		
Average	$0.015	$0.012
Range	$0.01-0.04	$0.006-0.018
PACKAGING OPERATIONS:		
Inspection and sorting:		
Before and after washing	2	1
After washing	2	-
Before washing	4	1
No information	8	-
Grading:		
Before washing	2	-
After washing	6	2
No information	8	-
Washing:		
Pressurized water sprays and soak tank combination	3	1
Agitated water tank and soak tank	2	1
Agitated water tank	3	-
No information	8	-
Water extraction:		
Centrifugal dryer:		
Mesh bag	6	1
Wire basket	2	1
No information	8	-
Packing--packer places bag over packing chute:		
Fills and weighs each bag	7	2
Fills the bag and passes to another operator for weighing	1	-
No information	8	-
Closing:		
Heat sealing	7	2
Staple	1	-
No information	8	-

BEET GREENS AND COLLARDS (Continued)

1954-55 Season

Item	Beet greens	Collards
COST OF MACHINERY AND EQUIPMENT:		
Inspection and grading table or belt and vibrating screens:		
Average	$470	$7,500
Range	$264-1,100	-
Other conveyors:		
Average	$3,405	$1,000
Range	$420-15,000	-
Washer:		
Agitator tank--average	$4,800	-
Soak tank:		
Average	$950	$950
Range	$400-1,500	-
Pressurized spray tank system:		
Average	$2,649	$15,000
Range	$835-8,000	-
Water extraction:		
Centrifugal:		
Average	$917	$975
Range	$75-5,000	-
(No data for other type systems)		
Packing table:		
Average	$1,793	$725
Range	$400-20,000	-
Heat sealers:		
Average	$874	$800
Range	$450-2,800	-
Scales (over-and-under):		
Average	$189	$88
Range	$75-400	-
Packing chutes:		
Average	$20	$20
Range	$15-25	$15-25
Ice-making machine:		
Average	$2,400	$2,400
Range	$2,200-2,600	$2,200-2,600
Wire stapler or stitcher:		
Average	$302	$650
Range	$150-600	-
Refrigeration:		
Average	$5,180	$10,000
Range	$2,000-30,000	-
Garbage disposal unit:		
Average	$2,960	$2,960
Range	$1,890-3,500	$1,890-3,500

BRUSSELS SPROUTS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	12
Maximum packing season	Sept.-Apr.
Usual packing season	Sept.-Apr.
Total production:	
Consumer packages	1.75 million
Pounds	1.75 million
Shipping containers for bulk brussels sprouts:	
Usual type	Drum
Average net weight	25 pounds
Other type	Bushel crate
Average net weight	25 pounds
Loss or waste in packaging:	
Average	10 percent
Range	1-30 percent

CONSUMER PACKAGE:

Usual type	Tray overwrapped with cellophane
Other type	Window carton and till basket
Size--net content	16 ounces
Cost per 1,000 trays:	
Average	$18.55
Range	$11-40
Window carton:	
Average	$20
Range	$15-25
Till basket:	
Average	$10

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	6
Range	6-12
Cost per container:	
Average	$0.08
Range	$0.04-0.13

PRODUCTION RATES AND DIRECT COST:

Workers in processing line:	
Average	7
Range	2-10
Consumer packages per hour:	
Average	390
Range	150-960
Labor cost per consumer package:	
Average	$0.02
Range	$0.01-0.04

PACKAGING OPERATIONS AT 12 PLANTS:

Inspection and sorting:	
Manually sort, inspect and trim	7 plants
No information	5 plants
Packing:	
Manually pack in tray and mechanically overwrap with film	5 plants
Manually pack in tray with film window	1 plant
Manually pack in basket	1 plant
No information	5 plants

COST OF MACHINERY AND EQUIPMENT:

Overwrap machine:	
Average	$5,140
Range	$3,200-8,000
Average cost of tables and benches	$165
Average cost of tray set machine	$28
Master carton stapling machine:	
Average	$405
Range	$28-650

CARROTS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	19
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-Aug.
Total production:	
Consumer packages	72.2 million
Pounds	87.1 million
Shipping containers for bulk carrots:	
Usual type	Bags
Average net weight	50-70-90 pounds
Shrinkage, trim, and unusable parts:	
Average	9.6 percent
Range	1-20 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content	16-32 ounces
Cost per 1,000:	
16-oz. bags: Average	$12.60
16-oz. bags: Range	$8-18
32-oz. bags: Average	$12.45

MASTER CONTAINERS:

Type:	
Usual	Wirebound crates
Other	Fiberboard
Consumer packages per container:	
Usual	48 1-lb. 24 2-lbs.
Range	12-48
Cost per container:	
Average	$0.146
Range	$0.05-0.40

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	16
Range	2-40
Consumer packages per hour:	
Average	2,658
Range	240-7,200
Labor cost per consumer package:	
Average	$0.012
Range	$0.005-0.02

PACKAGING OPERATIONS AT 19 PLANTS:

Inspection and sorting:	
Before and after washing	10
No information	9
Washing:	
Barrel type tumble washer for root vegetables	7 plants
Pressurized water spray system	3 plants
No information	9 plants
Water extraction:	
Drain on conveyor	10 plants
No information	9 plants
Weighing:	
Packer weighs, places bag over chute and fills bag	8 plants
Packer fills bag and another person weighs	1 plant
Operator fills chute and weighs, another operator fills bag	1 plant
No information	9 plants
Closing:	
Staple	4 plants
Tape	5 plants
Wire enclosed tape	1 plant
No information	9 plants

Continued

CARROTS (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Conveyor belts:	
Average	$1,091
Range	$435-3,000
Inspection and sorting table or belt:	
Average	$650
Range	$200-1,100
Washer:	
Barrel type:	
Average	$415
Range	$300-600
Pressurized water sprays:	
Average	$2,675
Range	$835-4,000
Drying table:	
Average	$1,200
Scales (over-and-under):	
Average	$230
Range	$125-400
Wire stapler:	
Average	$310
Range	$28-600
Tape dispenser:	
Average	$23
Range	$22-25
Carton stapler:	
Average	$265
Range	$150-500
Garbage disposal unit:	
Average	$2,850
Range	$1,890-3,500
Refrigeration:	
Average	$4,565
Range	$3,500-30,000
Entire carrot line:	
Average	$12,000

CELERY

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	27
Maximum packing season	Jan.-Dec.
Usual packing season	Jan.-Dec.
Total production:	
Consumer packages	21.2 million
Shipping containers for bulk celery:	
Usual type	Wirebound crate
Average net weight	60 pounds
Shrinkage, trim, and unusable parts:	
Average	17 percent
Range	2-33 percent

CONSUMER PACKAGE:

Usual type	Parchment wrap
Other type	In tray overwrapped with cellophane
Size--net content	2 hearts
Cost per 1,000:	
Parchment:	
Average	$3.28
Range	$2.50-4.15
Cellophane overwrap:	
Average	$12.07
Range	$9.35-15.00

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Other	Wirebound crates
Consumer packages per container:	
Usual	12
Range	6-48
Cost per container:	
Fiberboard:	
Average	$0.12
Range	$0.08-0.17

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	7
Range	1-14
Consumer packages per hour:	
Average	942
Range	72-2,400
Labor cost per consumer package:	
Average	$0.015
Range	$0.01-0.03

PACKAGING OPERATIONS AT 27 PLANTS:

Inspection and sorting:	
Manually sort, inspect, and trim	21
No information	6
Washing:	
Manually washes in tank tub.	6
Wash by pressurized sprays	15
No information	6
Water extraction:	
By blower	3
Drain	18
No information	6
Packing:	
Manually insert in cello bag through funnel	1
Manually place 2 celery hearts in fiberboard tray and mechanically overwrap with film	12
Manually wrap 2 celery hearts with parchment paper	8
No information	6

COST OF MACHINERY AND EQUIPMENT:

Trimming and inspection belt:	
Average	$720
Range	$420-1,200

CELERY (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Trimming and inspection table:	
Average	$225
Range	$100-400
Washer:	
Pressurized spray:	
Average	$2,540
Range	$600-6,000
Tank type:	
Average	$505
Range	$115-2,400
Packing table:	
Average	$350
Range	$50-1,200
Overwrap machine:	
Average	$6,590
Range	$1,800-11,000
Carton stapler or stitcher:	
Average	$305
Range	$150-600
Tray setup machine:	
Average	$2,750
Refrigeration:	
Average	$4,765
Range	$350-20,000
Garbage disposal unit:	
Average	$2,845
Range	$1,890-3,500

COLE SLAW AND TOSSED SALAD

1954-55 Season

Item	Cole slaw	Tossed salad
GENERAL INFORMATION:		
Plants surveyed	25	27
Maximum packing season	Sept.-Aug.	Sept.-Aug.
Usual packing season	Sept.-June	Sept.-June
Total production:		
Consumer packages	5.8 million	10 million
Pounds	2.8 million	5.2 million
Shrinkage, trim, and unusable parts:		
Average	24 percent	27 percent
Range	5-50 percent	3-60 percent
CONSUMER PACKAGE:		
Usual type	Film bag of 450-gage semi-moisture-proof cellophane	Film bag of 450-gage semimoisture-proof cellophane
Other type	Film bag of 300-gage semi-moisture-proof cellophane	Film bag of 300-gage semimoisture-proof cellophane
Size--net content	8 ounces	8 ounces
Cost per 1,000:		
Average	$9.58	$10.20
Range	$7-18	$7-20.55
MASTER CONTAINERS:		
Type:		
Usual	Fiberboard	Fiberboard
Consumer packages per container:		
Usual	6	6
Range	6-24	6-20
Cost per container:		
Average	$0.07	$0.06
Range	$0.035-0.135	$0.035-0.135
Cost of ice bag used in master containers:		
Average	$0.02	$0.02
Range	$0.005-0.025	$0.005-0.025
Cost of ice per bag:		
Average	$0.04	$0.038
Range	$0.025-0.086	$0.015-0.086

Continued

COLE SLAW AND TOSSED SALAD (Continued)

1954-55 Season

Item	Cole slaw	Tossed salad
PRODUCTION RATES AND DIRECT LABOR COST:		
Workers in processing line:		
Average	11	11
Range	4-25	4-25
Consumer packages per hour:		
Average	900	1,000
Range	120-2,700	150-2,700
Labor cost per consumer package:		
Average	$0.014	$0.016
Range	$0.005-0.034	$0.005-0.042
PACKAGING OPERATIONS:		
Inspection and sorting:		
Manually sort, inspect and trim.	17 plants	18 plants
No information	8 plants	8 plants
Washing:		
Pressurized water sprays	15 plants	15 plants
Manually in tank tub	2 plants	3 plants
No information	8 plants	8 plants
Water extraction:		
Mesh bag	1 plant	1 plant
Drain on table or bin.	16 plants	17 plants
No information	8 plants	8 plants
Packing--packer places bag over packing chute:		
Fills and weighs each bag.	12 plants	13 plants
Fills bag and passes to another operator for weighing	5 plants	5 plants
No information	8 plants	8 plants
Closing:		
Heat sealing	17 plants	18 plants
No information	8 plants	8 plants

Continued

COLE SLAW AND TOSSED SALAD (Continued)

1954-55 Season

Item	Cole slaw	Tossed salad
COST OF MACHINERY AND EQUIPMENT:		
Inspection, sorting, and trimming tables:		
Average	$2,430	$2,445
Range	$200-8,000	$200-8,000
Washer:		
Tank type:		
Average	$325	$380
Range	$250-400	$250-500
Pressurized water spray:		
Average	$3,665	$3,700
Range	$600-15,000	$600-15,000
Packing tables:		
Average	$585	$585
Range	$400-1,500	$400-1,500
Scales (over-and-under):		
Average	$200	$200
Range	$90-400	$90-400
Dicer:		
Average	$1,360	$1,110
Range	$200-3,000	$200-3,000
Shredder or chopper:		
Average	$270	$280
Range	$29-650	$29-650
Average cost of corer	$475	$475
Garbage disposal:		
Average	$2,700	$2,700
Range	$1,890-3,500	$1,890-3,500
Wire stapler or stitcher for closing bags:		
Average	$300	$290
Range	$28-650	$28-650
Heat sealer:		
Average	$615	$640
Range	$300-1,400	$300-1,500
Refrigeration:		
Average	$5,662	$5,662
Range	$1,000-30,000	$1,000-30,000

DANDELIONS, CHICORY, AND ESCAROLE

1954-55 Season

Item	Dandelions	Chicory	Escarole
GENERAL INFORMATION:			
Plants surveyed	3	5	4
Maximum packing season	Jan.-June	Jan.-Dec.	Jan.-Dec.
Usual packing season	Jan.-June	Jan.-May	Jan.-Dec.
Total production:			
Consumer packages	Less than 0.1 million	0.6 million	0.2 million
Pounds	0.0125	0.375	0.125
Shipping containers for bulk dandelions, chicory and escarole:			
Usual type	Crates	Crates	Crates
Average net weight	15 pounds	27 pounds	27 pounds
Other type	-	Bushel	-
Average net weight	-	22 pounds	-
Shrinkage, trim, and unusable part:			
Average	5 percent	12 percent	16 percent
Range	-	2-25	5-25
CONSUMER PACKAGE:			
Usual type	300-gage semi-moisture-proof cellophane bag	300-gage semi-moisture-proof cellophane bag	300-gage semi-moisture-proof cellophane bag
Other type	Acetate and 450-gage semimoisture-proof cellophane bag	Acetate and 450-gage semimoisture-proof cellophane bag	Acetate and 450-gage semimoisture-proof cellophane bag
Size--net content	8-10 ounce	8-10 ounce	10 ounce
Cost per 1,000:			
Average	$10	$13	$13
Range	-	$10-15	$10-15
MASTER CONTAINERS:			
Type:			
Usual	Fiberboard Wood crate	Fiberboard Wood crate	Fiberboard Wood crate
Other			
Consumer packages per container:			
Usual	12	12	12
Range	8-12	6-12	6-12

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
MASTER CONTAINERS (continued)			
Cost per container:			
Average	$0.10	$0.09	$0.09
Range	-	$0.07-0.10	$0.07-0.10
Cost of ice bag used in master container:			
Average	$0.02	$0.017	$0.017
Range	-	$0.005-0.025	$0.005-0.025
Cost of ice per bag:			
Average	-	$0.017	$0.017
Range	-	$0.009-0.025	$0.009-0.025
COST OF MACHINERY AND EQUIPMENT	Dollars	Dollars	Dollars
Inspection and grading table or belt and vibrating screens:			
Average	298	432	432
Low	200	381	381
High	381	600	600
Other conveyors:			
Average	1,343	1,950	1,950
Low	420	900	900
High	15,000	3,000	3,000
Washer:			
Pressurized spray tank system:			
Average	4,101	3,326	3,326
Low	2,135	2,135	2,135
High	8,000	4,800	4,800
Dryer:			
Centrifugal:			
Average	1,163	901	562
Low	950	300	300
High	3,000	3,500	950
(No data for other type systems)			
Heat sealers:			
Average	748	988	611
Low	600	400	400
High	1,142	1,400	1,142

Continued

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
	Dollars	Dollars	Dollars
COST OF MACHINERY AND EQUIPMENT (Continued)			
Scales (over-and-under):			
Average	172	116	116
Low	90	90	90
High	275	130	130
Wire stapler or stitcher:			
Average	357	190	207
Low	250	150	120
High	500	300	300
Refrigeration:			
Average	6,700	2,500	-
Low	3,500	-	-
High	30,000	-	-
Garbage disposal unit:			
Average	3,500	3,500	3,500
PRODUCTION RATES AND DIRECT LABOR COST:			
Workers in processing line:			
Average	25	10	10
Range	18-32	5-19	5-19
Consumer packages per hour:			
Average	950	1,030	1,133
Range	350-600	600-1,600	600-1,600
Labor cost per consumer package:			
Average	$0.054	$0.013	$0.015
Range	$0.053-0.054	$0.001-0.018	$0.012-0.018
PACKAGING PLANT OPERATIONS:	Number of Plants		
Inspection and sorting:			
Before and after washing	1	1	1
Before washing	1	4	3
No information	1	-	-
Total	3	5	4

Continued

DANDELIONS, CHICORY, AND ESCAROLE (Continued)

1954-55 Season

Item	Dandelions	Chicory	Escarole
		Number of Plants	
PACKAGING PLANT OPERATIONS: (Continued)			
Grading:			
Before washing	1	3	2
After washing	1	2	2
No information	1	-	-
Total	3	5	4
Washing:			
Pressurized water sprays and soak tank combination	2	4	3
Agitated water tank	-	1	1
No information	1	-	-
Total	3	5	4
Water extraction:			
Centrifugal dryer units:			
Mesh bags	2	3	3
Wire basket	-	2	1
No information	1	-	-
Total	3	5	4
Packing--packer places bag over packing chute:			
Fills and weighs each bag	2	4	3
Fills bag and passes to another operator for weighing	-	1	1
No information	1	-	-
Total	3	5	4
Closing:			
Heat sealing	2	5	4
No information	1	-	-
Total	3	5	4

GARLIC

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	3
Maximum packing season	Jan.-Dec.
Usual packing season	Sept.-June
Total production:	
Consumer packages	1.7 million
Pounds	0.27 million
Shipping containers for bulk garlic:	
Usual type	Wood crate and fiberboard carton
Average net weight	18-30-50 pounds
Shrinkage, trim, and unusable parts:	
Average	10 percent
Range	2-19 percent

CONSUMER PACKAGE:

Usual type	Window box
Other type	Film bag
Size--net content	2-oz. (2 sets to a container)
Cost per 1,000:	
Window box:	
Average	$8.80
Range	$7.75-9.90
Film bag:- Average	$11

MASTER CONTAINERS:

Usual type	Cardboard
Consumer packages per container:	
Usual	12
Cost per container:	
Average	$0.05
Range	$0.04-0.07

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	5
Range	2-7
Consumer packages per hour:	
Average	1,520
Range	640-2,400

GRAPEFRUIT

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	2
Maximum packing season	Nov.-May
Usual packing season	Nov.-April
Total production:	
Consumer packages	0.3 million
Pounds	2.3 million
Shipping containers for bulk grapefruit:	
Usual type	Bruce box
Average net weight	83 pounds
Other type	Wood box
Average net weight	100 pounds
Shrinkage, trim, and unusable parts:	
Average	8 percent
Range	1-15 percent

CONSUMER PACKAGE:

Usual type	Mesh bag
Other type	Polyethylene
Size--net content	5 pounds
Cost per 1,000:	
Average (5-lb. mesh)	$47
Average (6 count poly)	$22

MASTER CONTAINERS:

Type:	
Usual	Banana box
Consumer packages per container:	
Usual	12
Cost per container:	
Average	$6.25

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	8
Range	14-22
Consumer packages per hour:	
Average	1,800
Range	1,500-2,100
Labor cost per consumer package:	
Average	$0.013
Range	$0.012-0.015

PACKAGING OPERATIONS AT 2 PLANTS:

Dumping:	
Manually dump grapefruit on inspection belt from cribs	1 plant
Manually on conveyor belt from container	1 plant
Inspection and sorting:	
Manually inspect and sort	2 plants
Grading:	
Manually grade	2 plants
Washing (when necessary):	
Soak tank and pressurized water sprays	2 plants
Sizing:	
Manually size	2 plants
Packing:	
Automatic weighing and bagging	1 plant
Bagger counts fruit and fills bag	1 plant
Closing:	
Manually close bag with Quik-Lok	1 plant
Manually close bag with wire enclosed tape	1 plant

COST OF MACHINERY AND EQUIPMENT:

Average cost of grapefruit processing line	$7,263

KALE

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	14
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages	4.3 million
Pounds	2.7 million
Shipping containers for bulk kale:	
Usual type	Bushel basket
Average net weight	19 pounds
Other type	Wirebound crates
Average net weight	30 pounds
Shrinkage, trimmed, and unusable parts (stripped and unstripped):	
Average	14 percent
Range	3-35 percent

CONSUMER PACKAGE:

Usual type	450-gage semi-moisture-proof cellophane film bag
Other type	Polyethylene film bag
Size--net content	10 ounces
Cost per 1,000:	
Average	$14.50
Range	$6.50-17

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Other	Wood crate
Consumer packages per container:	
Usual	12
Range	6-12
Cost per container:	
Average	$0.11
Range	$0.06-0.15
Cost of ice bag used in master containers:	
Average	$0.02
Range	$0.015-0.035
Cost of ice per bag:	
Average	$0.02
Range	$0.01-0.03

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	15
Range	3-42
Consumer packages per hour:	
Average	1,208
Range	600-2,700
Labor cost per consumer package:	
Average	$0.015
Range	$0.004-0.03

PACKAGING OPERATIONS AT 14 PLANTS:

Inspection and sorting:	
Before and after washing	1
After washing	4
Before washing	5
No information	3
Grading:	
Before washing	2
After washing	9
No information	3
Washing:	
Pressurized water sprays and soak tank combination	8
Agitated water tank and soak tank	2
Agitated water tank	1
No information	3

Continued

KALE (Continued)

1954-55 Season

PACKAGING OPERATIONS AT 14 PLANTS: (Continued)

Water extraction:	
Centrifugal dryer unit:	
Mesh bag	9
Wire basket	1
Drying table with blower attachment	1
No information	3
Packer places bag over packing chute:	
Fills bag and weighs each bag	9
Fills bag and passes to another operation for weighing	2
No information	3
Closing:	
Heat sealing	10
Staple	1
No information	3

COST OF MACHINERY AND EQUIPMENT:

Inspection and grading table or belt and vibrating screen:	
Average	$2,625
Range	$200-8,000
Other conveyors:	
Average	$893
Range	$300-2,500
Washer:	
Agitator tank:	
Average	$825
Range	$250-1,400
Soak tank:	
Average	$625
Range	$200-1,500
Pressurized spray tank system:	
Average	$4,887
Range	$600-15,000
Dryer:	
Centrifugal:	
Average	$649
Range	$75-3,500
(No data for other type systems)	
Packing table:	
Average	$717
Range	$200-1,500
Heat sealers:	
Average	$880
Range	$400-1,400
Scales (over-and-under):	
Average	$162
Range	$75-275
Packing chutes:	
Average	$25
Wire stapler or stitcher for closing bags:	
Average	$226
Range	$150-650
Ice bag sealer--Average	$200
Refrigeration:	
Average	$9,800
Range	$5,000-28,000
Garbage disposal unit--average	$3,500

LETTUCE

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	5
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages	0.9 million
Shipping containers for bulk lettuce:	
Usual type	Fiberboard carton
Average net weight	50 pounds
Other type	Crates
Average net weight	30 pounds
Shrinkage, trim, and unusable portion:	
Average	3.7 percent
Range	2-5 percent

CONSUMER PACKAGE:

Usual type	Wrapped with 300-gage semimoisture-proof cellophane
Other type	Tray overwrapped with cellophane
Size--net content	1 head
Cost per 1,000 trays:	
Average (cost of cello for overwrap not available)	$10.70
Range	$10.40-11
Cost of cellophane for direct wrap:	
Average per head	$0.01
Range per head	$0.007-0.013

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer pkgs. per container:	
Usual	24
Range	8-24
Cost per container:	
Average	$0.17
Range	$0.05-0.39

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	10
Range	1-25
Consumer packages per hour:	
Average	1,862
Range	72-3,840
Labor cost per consumer package:	
Average	$0.01
Range	$0.007-0.016

PACKAGING OPERATIONS AT 5 PLANTS:

Inspection and sorting:	
Manually trim, sort, and inspect	5
Packing:	
Manually inspect, sort, and place in tray for automatic overwrap	2
Manually inspect and sort and direct overwrap mechanically	3

COST OF MACHINERY AND EQUIPMENT:

Trimming and inspection table:	
Average	$150
Conveyor belt:	
Average	$2,600
Overwrap machine:	
Average	$8,933
Range	$6,000-13,000
Heat sealer:	
Average	$44
Range	$28-60
Garbage disposal unit:	
Average	$2,045
Range	$750-3,500
Refrigeration:	
Average	$6,570
Range	$6,000-20,000

ONIONS (DRY)

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	13
Maximum packing season	Sept.-Aug.
Usual packing season	Oct.-July
Total production:	
Consumer packages	3.5 million
Pounds	7.7 million
Shipping containers for bulk onions:	
Usual type	Crates
Average net weight	50 pounds
Other types	Sacks
Average net weight	50 pounds
Shrinkage and unusable parts:	
Average	13 percent
Range	1-50 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Mesh bag
Size--net content	3 pounds
Cost per 1,000:	
Average, polyethylene	$16.40
Range, polyethylene	$10-25.65
Average, mesh	$49.67
Range, mesh	$19-75

MASTER CONTAINERS:

Type:	
Usual	Paper bags
Other	Wirebound crate Fiberboard carton
Consumer packages per container:	
Usual	16
Range	12-24
Cost per container:	
Average, paper bag	$0.085
Range, paper bag	$0.08-0.10
Average, wirebound	$0.15
Average, fiberboard	$0.11
Range, fiberboard	$0.08-0.14

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	11
Range	6-24
Consumer packages per hour:	
Average	1,200
Range	125-3,000
Labor cost per consumer package:	
Average	$0.01
Range	$0.003-0.014

PACKAGING OPERATIONS AT 13 PLANTS:

Inspection and sorting before packing:	
No washing required	11 plants
No information	2 plants
Packing:	
Semiautomatic weighing and bagging	6 plants
Automatic weighing and bagging	4 plants
No information	3 plants
Closing:	
Staple	10 plants
Wire enclosed tape	1 plant
No information	2 plants

COST OF MACHINERY AND EQUIPMENT:

Average cost inspection and sorting table	$1,500
Semiautomatic weighing machine:	
Average	$3,680
Range	$1,000-9,000
Scales (over-and-under):	
Average	$206
Range	$90-240
Carton stapler:	
Average	$157
Range	$5-650
Grader:	
Average	$833
Range	$300-1,800

ORANGES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	2
Maximum packing season	Jan.-Dec.
Usual packing season	Dec.-Sept.
Total production:	
Consumer packages	4.9 million
Pounds	24.6 million
Shipping containers for bulk oranges:	
Usual type	Full telescope fiberboard box
Average net weight	45 pounds
Shrinkage, trim, and unusable part:	
Average	13 percent
Range	8-17 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Mesh bag
Size--net content	4-5 pounds
Cost per 1,000:	
Average, 5-lb. poly.	$23.25
Range	$21-25.50
Average, 4-lb. poly.	$24.20
Average, 5-lb. mesh.	$46.88

MASTER CONTAINERS:

Type:	
Usual	Full telescope fiberboard box
Consumer packages per container:	
Usual	6

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	19
Range	14-24
Consumer packages per hour:	
Average	1,490
Range	1,200-1,780
Labor cost per consumer package:	
Average	$0.014
Range	$0.013-0.016

PACKAGING OPERATIONS AT 2 PLANTS:

Dumping:	
Manually dump oranges on inspection belt from cribs	1 plant
Manually on conveyor belt from container	1 plant
Inspection and sorting:	
Manually inspect and sort	2 plants
Grading:	
Manually grade	2 plants
Washing (when necessary):	
Soak tank and pressurized water sprays	2 plants
Sizing:	
Manually size	2 plants
Packing:	
Automatic weighing and bagging	1 plant
Bagger counts fruit and fills bag	1 plant
Closing:	
Manually close bag with Quik-Lok	1 plant
Manually close bag with wire enclosed tape	1 plant

COST OF MACHINERY AND EQUIPMENT:

Average cost of orange processing line	$7,263

PARSNIPS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	18
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-April
Total production:	
Consumer packages	5.5 million
Pounds	5.5 million
Shipping containers for bulk parsnips:	
Usual type	Bushel basket
Average net weight	45 pounds
Other type	40-lb. crate
Average net weight	20 pounds
Shrinkage, trim, and unusable part:	
Average	10 percent
Range	1-25 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content	16-ounce
Cost per 1,000:	
Average	$12.89
Range	$8.65-16

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	12
Range	6-24
Cost per container:	
Average	$0.095
Range	$0.05-0.15

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	10
Range	2-18
Consumer packages per hour:	
Average	1,500
Range	120-3,600
Labor cost per consumer package:	
Average	$0.01
Range	$0.005-0.02

PACKAGING OPERATIONS AT 18 PLANTS:

Inspection and sorting:	
Before and after washing	9 plants
No information	9 plants
Washing:	
Barrel type tumble washer for root vegetables	5 plants
No information	9 plants
Water extraction:	
Drain on tables and conveyor belts	9 plants
No information	9 plants
Weighing:	
Packer weighs, inserts bag over chute and fills bag	7 plants
Packer fills bag and another person weighs	2 plants
No information	9 plants
Closing:	
Staple	3 plants
Tape	4 plants
Wire enclosed tape	2 plants
No information	9 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection, grading, and sorting table:	
Average	$430
Range	$200-1,100
Other conveyors:	
Average	$1,000
Range	$300-2,500

Continued

PARSNIPS (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Washer:	
Barrel type:	
Average	$300
Pressurized water sprays:	
Average	$4,860
Range	1/ $835-15,000
Packing table:	
Average	$765
Range	$400-1,500
Scales (over-and-under):	
Average	$220
Range	$90-400
Wire stapler:	
Average	$245
Range	$28-450
Tape dispenser:	
Average	$25
Carton stapler:	
Average	$500
Range	$300-600
Garbage disposal unit:	
Average	$2,630
Range	$1,890-3,500
Refrigeration:	
Average	$14,333
Range	$5,000-20,000

1/ Entire processing line cost.

POTATOES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	8
Maximum packing season	Jan.-Dec.
Usual packing season	Oct.-May
Total production:	
Consumer packages	7.1 million
Pounds	41.2 million
Shipping containers for bulk potatoes:	
Usual type	Sacks
Average net weight	100 pounds
Other type	Crates
Average net weight	50 pounds
Shrinkage, trim, and unusable part:	
Average	16 percent
Range	5-28 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Other type	Paper and cellophane bag
Size--net content	1-3-4-5-10-15 lbs.
Cost per 1,000:	
Average for 1-lb. poly.	$9
Average for 3-lb. poly.	$24
Average for 4-lb. poly.	$20
Average for 5-lb. poly.	$21.44
Range	$18.75-24.50
Average for 5-lb. paper bags	$18.75
Average for 10-lb. solid paper bags	$22.40
Range	$12.80-32
Average for 10-lb. paper window bags	$37
Range	$12.80-40
Average for 15-lb. paper window bags	$45
Average for 15-lb. solid paper bags	$45

MASTER CONTAINERS:

Type:	
Usual	Bags
Other	Fiberboard, wood and banana boxes
Consumer packages per container:	
Usual	10
Range	5-15
Cost per container:	
Average	$0.058
Range	$0.04-0.10

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	15
Range	6-24
Consumer packages per hour:	
Average	1,153
Range	240-2,880
Master containers packed per hour:	
Average	141
Range	20-240
Labor cost per consumer package:	
Average	$0.017

PACKAGING OPERATIONS AT 8 PLANTS:

Manually dump potatoes on packing table	2 plants
Manually dump potatoes on inspection belt from cribs	1 plant
No information	5 plants
Inspection and sorting:	
Manually inspect and sort	3 plants
No information	5 plants
Grading:	
Manually grade	1 plant
Mechanically grade	2 plants
No information	5 plants

Continued

POTATOES (Continued)

1954-55 Season

PACKAGING OPERATIONS AT 8 PLANTS: (Continued)

Packing:	
Mechanically weigh and fill bag	3 plants
No information	5 plants
Closing:	
Manually close bag with Quik-Lok	1 plant
Manually close bag with wire enclosed tape	1 plant
Mechanically close bag with wire staple	1 plant
No information	5 plants

COST OF MACHINERY AND EQUIPMENT:

Average cost of:	
Potato line	$12,000
Kiwi Koder	$210
Roller grader	$4,150
Range	$467-7,500
Conveyor line	$1,000
Scales (over-and-under)	$290
Potato bagging machine	$5,215
Range	$1,062-12,000
Potato washing machine	$2,175
Sewing machine	$1,200
Stitcher	$1,021

RADISHES

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	17
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-July
Total production:	
Consumer packages	23.5 million
Pounds	9.0 million
Shipping containers for bulk radishes:	
Usual type	Crates
Average net weight	40 pounds
Other type	Bushel
Average net weight	40 pounds
Shrinkage, trim, and unusable parts:	
Average	8 percent
Range	2-20 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content	6 ounces
Cost per 1,000:	
Average	$8
Range	$6-12

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	24
Range	12-48
Cost per container:	
Average	$0.073
Range	$0.04-0.013

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	8
Range	2-16
Consumer packages per hour:	
Average	1,256
Range	200-3,600
Labor cost per consumer package:	
Average	$0.01
Range	$0.005-0.04

PACKAGING OPERATIONS AT 17 PLANTS:

Inspection and sorting:	
Before and after washing	12 plants
No information	5 plants
Washing:	
Barrel type tumble washer for root vegetables	11 plants
Pressurized water spray system	1 plant
No information	5 plants
Water extraction:	
Drain on tables or conveyor	12 plants
No information	5 plants
Packing:	
Semiautomatic weighing and bagging	11 plants
Automatic weighing and bagging	1 plant
No information	5 plants
Weighing:	
Packer fills bag and another person weighs	12 plants
No information	5 plants
Closing:	
Heat-seal	12 plants
No information	5 plants

Continued

RADISHES (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Conveyor belts:	
Average	$500
Range	$300-1,000
Washer:	
Barrel type:	
Average	$345
Pressurized water sprays:	
Average	$4,700
Range	$600-15,000
Other:	
Average	$400
Semiautomatic radish bagging and weighing machine:	
Average	$570
Range	$500-640
Scales (over-and-under):	
Average	$225
Range	$90-640
Heat sealer:	
Average	$900
Range	$60-1,500
Carton stapler:	
Average	$300
Range	$28-650
Garbage disposal unit:	
Average	$2,650
Range	$1,890-3,500
Refrigeration:	
Average	$4,250
Range	$5,000-6,000
Cutting Machine:	
Average	$200

SOUP MIX

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	14
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages	2.4 million
Pounds	1.4 million
Shrinkage, trim, and unusable part:	
Average	18 percent
Range	3-45 percent

CONSUMER PACKAGE:

Usual type	450-gage semimoisture-proof cellophane bag
Other type	300-gage semimoisture-proof cellophane bag
Size--net content	10 ounces
Cost per 1,000:	
Average	$12.05
Range	$8-28.77

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	6
Range	6-12
Cost per container:	
Average	$0.06
Range	$0.035-0.12
Cost of ice bag used in master containers:	
Average	$0.017
Range	$0.005-0.025
Cost of ice per bag:	
Average	$0.023
Range	$0.008-0.035

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	10
Range	4-23
Consumer packages per hour:	
Average	1,145
Range	150-2,700
Labor cost per consumer container:	
Average	$0.017
Range	$0.005-0.042

PACKAGING OPERATIONS AT 14 PLANTS:

Inspection and sorting:	
Manually sort, inspect and trim	13 plants
No information	1 plant
Washing:	
Pressurized water sprays	10 plants
Manually in tank tub	3 plants
No information	1 plant
Water extraction:	
Mesh bag	1 plant
Drain on table or bin	12 plants
No information	1 plant
Packing:	
Vegetables selected and bagged manually	13 plants
No information	1 plant
Closing:	
Heat sealed	1 plant
Tape	1 plant
Staple	11 plants
No information	1 plant
Master container:	
Manually packs consumer packages in fiberboard containers	13 plants
No information	1 plant

Continued

SOUP MIX (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT:

Inspection, sorting and trimming tables:	
Average	$3,550
Range	$200-8,000
Washer:	
Tank type.	
Average	$630
Range	$400-1,000
Pressurized water spray:	
Average	$4,860
Range	$600-15,000
Packing tables:	
Average	$585
Range	$400-1,500
Scales (over-and-under):	
Average	$180
Range	$90-400
Dicer:	
Average	$1,240
Range	$200-3,000
Shredder or chopper:	
Average	$270
Range	$200-450
Wire stapler or wire stitcher for closing bags:	
Average	$255
Range	$120-650
Tape dispenser:	
Average	$25
Refrigeration.	
Average	$5,662
Range	$1,000-30,000

SPINACH

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	36
Maximum packing season	Sept.-Aug.
Usual packing season	Sept.-June
Total production:	
Consumer packages	49.2 million
Pounds	32.7 million
Shipping containers for bulk spinach:	
Usual type	Bushel basket
Average net weight	21 pounds
Other type	Wirebound crate
Average net weight	30 pounds
Shrinkage, trim, and unusable part (cut leaf and root spinach):	
Average	16 percent
Range	2-45 percent

CONSUMER PACKAGE:

Usual type	Film bag of 300-gage semi-moisture-proof cellophane
Other type	Film bag of 450-gage semi-moisture-proof cellophane
Size--net content	10 ounces
Cost per 1,000:	
Average	$13.55
Range	$8-17

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	12
Range	6-12
Cost per container:	
Average	$0.10
Range	$0.05-0.10
Cost of ice bag used in master containers:	
Average	$0.02
Range	$0.01-0.03
Cost of ice per bag:	
Average	$0.02
Range	$0.01-0.035

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	14
Range	1-42
Consumer packages per hour:	
Average	1,000
Range	120-2,700
Labor cost per consumer package:	
Average	$0.014
Range	$0.01-0.03

PACKAGING OPERATIONS AT 36 PLANTS:

Inspection and sorting:	
Before and after washing	5 plants
After washing	6 plants
Before washing	15 plants
No information	10 plants
Grading:	
Before washing	3 plants
After washing	21 plants
No information	12 plants
Washing:	
Pressurized water sprays and soak tank combination	13 plants
Agitated water tank and soak tank	3 plants
Agitated water tank	9 plants
Automatic wash tank, dryer and dumper combination	1 plant
No information	10 plants

Continued

SPINACH (Continued)

1954-55 Season

PACKAGING OPERATIONS AT 36 PLANTS: (Continued)

Water extraction:	
Centrifugal dryer unit:	
Mesh bag	21 plants
Wire basket	4 plants
Drying table with blower attachment:	1 plant
No information	10 plants
Packing--packer places bag over packing chute:	
Fills and weighs each bag	19 plants
Fills bag and passes to another operator for weighing	6 plants
Weighs spinach and fills bags	1 plant
No information	10 plants
Closing:	
Heat sealing	23 plants
Staple	3 plants
No information	10 plants

COST OF MACHINERY AND EQUIPMENT:

Inspection and grading tables or belt and vibrating screens:	
Average	$1,209
Range	$200-8,000
Other conveyors:	
Average	$1,310
Range	$300-15,000
Washer:	
Agitator tank:	
Average	$1,075
Range	$250-4,800
Soak tank:	
Average	$267
Range	$200-1,000
Pressurized spray tank system:	
Average	$3,557
Range	$1,000-15,000
Average cost of automatic wash and dry combination:	
Average	$10,000
Dryer:	
Centrifugal:	
Average	$716
Range	$200-3,500
(No data for other type systems)	
Packing table:	
Average	$478
Range	$200-2,500
Heat sealers:	
Average	$151
Range	$28-2,600
Scales (over-and-under):	
Average	$172
Range	$75-500
Average cost of packing chutes	$15
Ice-making machine:	
Average	$2,933
Range	$2,200-4,000
Wire stapler or stitcher for closing bags:	
Average	$279
Range	$10-650
Average cost of ice bag sealer	$200
Refrigeration:	
Average	$5,662
Range	$1,000-30,000
Garbage disposal unit:	
Average	$2,410
Range	$750-3,500

TURNIPS

1954-55 Season

GENERAL INFORMATION:

Plants surveyed	18
Maximum packing season	Sept.-Aug.
Usual packing season	Oct.-April
Total production:	
Consumer packages	2.4 million
Pounds	2.3 million
Shipping containers for bulk turnips:	
Usual type	Bushel basket
Average net weight	50 pounds
Other type	½-bushel basket
Average net weight	25 pounds
Shrinkage, trim, and unusable parts:	
Average	8 percent
Range	2-20 percent

CONSUMER PACKAGE:

Usual type	Polyethylene bag
Size--net content	24 ounces
Cost per 1,000:	
Average	$12.77
Range	$8-16.50

MASTER CONTAINERS:

Type:	
Usual	Fiberboard
Consumer packages per container:	
Usual	12
Range	6-24
Cost per container:	
Average	$0.11
Range	$0.06-0.15

PRODUCTION RATES AND DIRECT LABOR COST:

Workers in processing line:	
Average	10
Range	2-18
Consumer packages per hour:	
Average	1,465
Range	400-3,600
Labor cost per consumer package--Average	$0.013
Range	$0.005-0.048

PACKAGING OPERATIONS AT 18 PLANTS:

Inspection and sorting:	
Before and after washing	10 plants
No information	8 plants
Washing:	
Barrel type tumble washer for root vegetables	7 plants
Pressurized water spray system	3 plants
No information	8 plants
Water extraction:	
Drain on table and conveyor belt	10 plants
No information	8 plants
Packing:	
Semiautomatic weighing and bagging	2 plants
Automatic weighing and bagging	1 plant
Weighing:	
Packer weighs inserts bag over chute and fills bag	6 plants
Packer fills bag and another person weighs	1 plant
No information	8 plants
Closing:	
Staple	6 plants
Tape	2 plants
Wire enclosed tape	2 plants
No information	8 plants

COST OF MACHINERY AND EQUIPMENT:

Washer:	
Barrel type:	
Average	$400
Pressurized water sprays:	
Average	$4,000
Range	$600-15,000

Continued

TURNIPS (Continued)

1954-55 Season

COST OF MACHINERY AND EQUIPMENT: (Continued)

Wire stapler:	
Average	$240
Range	$150-400
Tape dispenser:	
Average	$25
Carton stapler:	
Average	$520
Garbage disposal unit:	
Average	$3,500
Refrigeration:	
Average	$5,000
Poly bag closer:	
Average	$1,400

GENERAL INFORMATION ON COMMODITIES REPORTED PACKAGED BY ONLY ONE PLANT

Information is not shown in tabular form for those commodities reported packaged by only one plant to avoid disclosure of data that might indicate identity of reporting firm. Those commodities are blueberries, lemons, mushrooms, mustard greens, parsley, rutabagas, squash, and turnip tops. However, general information on those commodities follows:

Blueberries

Packed during June and July. The consumer package was a plastic tray overwrapped with 300-gage semimoisture-proof cellophane, 1-pound in net content. Twelve 1-pound trays were packed in the fiberboard master containers. The packing operation was done primarily by hand.

Lemons

The packing season was May through December. The consumer package was 4- and 6-count in polyethylene bag or fiberboard tray. The fiberboard master container held 24 consumer packages. Labor cost was 1 cent per consumer package. In the packing operation, the lemons were manually dumped on a conveyor belt, and inspected and graded. They were bagged by a semiautomatic bagging machine or manually placed in fiberboard trays. The package was manually closed with a wire enclosed in tape.

Mushrooms

The packing season was from October through April. The consumer package was a fiberboard box overwrapped with acetate film, a net content of 8 ounces. Twelve 8-ounce packages were packed in a fiberboard master container. Labor cost was 1 cent per consumer package. The packaging operation consisted in manually inspecting, sorting, and placing mushrooms in the fiberboard tray. The package was closed mechanically by overwrapping with acetate.

Mustard Greens

The packing season was from September through June. The consumer package was a film bag of 300-gage semimoisture-proof cellophane, a net content of 20 ounces, closed by heat sealing. Six packages filled the fiberboard master container. Labor cost was 1.8 cents per consumer package. The packing operation consisted in manually inspecting and sorting, bagging, weighing, grading, washing, drying, and closing. Packing methods and machinery and equipment used were essentially the same as for spinach (pages 38 and 39).

Parsley

The packing season was from October through March. The consumer package was a film bag of 300-gage semimoisture-proof cellophane, net content of 3 ounces, heat-sealed and 12 packages to the fiberboard master container. Labor cost was 2 cents per consumer package. The packing operation consisted in manually inspecting, sorting, bagging, weighing, grading, washing, drying, and closing. Packing methods and machinery and equipment used were essentially the same as for spinach.

Diced Rutabagas

The packing season was October through May. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 16 ounces, heat-sealed and six 16-ounce packages to the master container. Labor cost was 3 cents per consumer package.

Squash

The packing season was October through January. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 16 ounces, and six 16-ounce packages to the fiberboard master container. Labor cost was 3 cents per consumer package.

Turnip Tops

The packing season was from September through June. The consumer package was a film bag of 450-gage semimoisture-proof cellophane, a net content of 20 ounces, heat-sealed and with six 20-ounce packages to the fiberboard master container. Labor cost was 1.8 cents per consumer package. The packing operation consisted of manually inspecting, sorting, bagging, weighing, grading, washing, drying, and closing. Methods and machinery and equipment used were essentially the same as for spinach.

GENERAL INFORMATION

1954-55 Season

Plants surveyed	58
Length of season:	
Average	10 months
Range	4-12 months
Length of workweek:	
Average	6 days
Range	5-7 days
Length of workday:	
Average	8 hours
Range	5-16 hours
Number of employees per plant	2-100
Commodity distribution by type of user:	
Proportion of commodities distributed to specific type user:	
Chain retail stores	36 percent
Independent retail stores	31 percent
Wholesalers	27 percent
Jobbers and others	6 percent
Commodity distribution within specified area limits:	
Proportion of commodities distributed within specified areas:	
Less than 25 miles	38 percent
25 miles and under 49 miles	39 percent
50 miles and under 99 miles	12 percent
100 miles and over	11 percent
How commodities are distributed:	
Delivered	85 percent
Picked up at plant	15 percent
Real estate:	
Value:	
Average	$102,000
Range	$200-600,000
Machinery and equipment:	
Value:	
Average	$23,381
Range	$100-125,000

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