



California
Manufacturing Cost
Annual 2006

Compiled and Published in 2007



CALIFORNIA

Manufacturing Cost Annual

Compiled and Published in 2007

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This publication would not be possible without the cooperation of the individuals and firms engaged in the production, manufacture, and distribution of milk and dairy products.



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Table of Contents

Introduction.....	6
Highlights of the Manufacturing Cost Studies.....	6
Labor was the Largest Cost Component.....	7
Cheddar Cheese Study	8
Overview	8
Characteristics of Cheddar Cheese Plants	10
Butter Study.....	17
Overview	17
Characteristics of Butter Plants.....	19
Nonfat Dry Milk Study.....	25
Overview	25
Characteristics of Nonfat Dry Milk Plants.....	27
Whey Study	33
Overview	33
Condensed Skim and Cream Studies	37
Overview of Condensed Skim.....	37
Cream Overview	38

List of Tables

Table 1. Processing Costs for Seven California Cheddar Cheese Plants	9
Table 2. Cheddar Cheese Production Parameters from Cost Studies	10
Table 3. Processing Costs for Eight California Butter Plants.....	18
Table 4. Processing Costs for Ten California Nonfat Dry Milk Plants	26
Table 5. Processing Costs for Three California Skim Whey Powder Plants.....	34

List of Figures

Figure 1. Comparison of Costs by Category for California Manufacturing Plants	7
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For Cheddar Cheese Cost Study:

Figure 2. Simplified Product Flow in a Cheese Plant with By-Product Processing	11
Figure 3. Breakdown of Cheddar Cheese Processing Costs	12
Figure 4. Breakdown of Cheddar Cheese Packaging Sizes	12
Figure 5. Annual California Cheddar and Jack Cheese Production	13
Figure 6. Cheddar Cheese Manufacturing Cost Per Pound.....	13

For Cheddar Cheese Cost Study, Continued:

Figure 7. Share of California Cheddar Cheese Production by Ownership Type	13
Figure 8. Cheddar Cheese Processing Labor Cost Per Pound.....	14
Figure 9. Cheddar Cheese Processing Non-Labor Cost Per Pound	14
Figure 10. Cheddar Cheese Labor Breakdown by Category in Cents Per Pound	14
Figure 11. Utility Cost Per Pound in Cheddar Cheese Plants	15
Figure 12. Repairs, Maintenance and Supplies Cost Per Pound in Cheddar Cheese Plants	15
Figure 13. Comparison of Payroll Breakdown for Cheddar Cheese Plant Employees, Hourly and Salaried.....	16
Figure 14. Cheese Processing Cost Comparison, 2003-2005	16

For Butter Cost Study:

Figure 15. Simplified Product Flow in a Butter Plant	19
Figure 16. Breakdown of Butter Processing Costs.....	20
Figure 17. Breakdown of Butter Packaging Sizes	20
Figure 18. Annual California Butter Production	21
Figure 19. Butter Manufacturing Cost Per Pound.....	21
Figure 20. Share of California Butter Production by Ownership Type	21
Figure 21. Butter Processing Labor Cost Per Pound	22
Figure 22. Butter Processing Non-Labor Cost Per Pound.....	22
Figure 23. Butter Labor Breakdown by Category in Cents Per Pound.....	22
Figure 24. Utility Cost Per Pound in Butter Plants.....	23
Figure 25. Repairs, Maintenance, and Supplies Cost Per Pound in Butter Plants.....	23
Figure 26. Comparison of Payroll Breakdown for Butter Plant Employees	24
Figure 27. Butter Processing Cost Comparison, 2003-2005.....	24

For Nonfat Dry Milk Cost Study:

Figure 28. Simplified Product Flow in a Nonfat Dry Milk Plant	27
Figure 29. Breakdown of Nonfat Dry Milk Processing Costs.....	28
Figure 30. Breakdown of Nonfat Dry Milk Packaging Sizes	28
Figure 31. Annual California Nonfat Dry Milk Production	29
Figure 32. Nonfat Dry Milk Manufacturing Cost Per Pound.....	29
Figure 33. Share of California Nonfat Dry Milk Production by Ownership Type	29
Figure 34. Nonfat Dry Milk Processing Labor Cost Per Pound	30
Figure 35. Nonfat Dry Milk Processing Non-Labor Cost Per Pound.....	30



For Nonfat Dry Milk Cost Study, Continued:

Figure 36. Nonfat Dry Milk Labor Breakdown by Category in Cents Per Pound30
 Figure 37. Utility Cost Per Pound in Nonfat Dry Milk Plants.....31
 Figure 38. Repairs, Maintenance, and Supplies Cost Per Pound in
 Nonfat Dry Milk Plants.....31
 Figure 39. Weighted Average Breakdown of Dollars Spent Per Year on Energy31
 Figure 40. Comparison of Payroll Breakdown for Nonfat Dry Milk Plant
 Employees.....32
 Figure 41. Nonfat Dry Milk Processing Cost Comparison, 2003-2005.....32

For Skim Whey Powder Studies:

Figure 42. Annual Skim Whey Powder Products.....35
 Figure 43. Weighted Average Breakdown of Dollars Spent Per Year on Energy35
 Figure 44. Share of California Skim Whey Powder Production by Ownership Type36
 Figure 45. Skim Whey Powder Labor Breakdown by Category36
 Figure 46. Comparison of Payroll Breakdown for Skim Whey Powder Plant
 Employees36

For Condensed Skim and Cream Studies:

Figure 47. Annual Condensed Skim Products.....37
 Figure 48. Comparison of Processing Costs for Condensed Skim37
 Figure 49. Breakdown of Condensed Skim Processing Costs38
 Figure 50. Annual Cream Production39
 Figure 51. Comparison of Processing Costs for Cream.....39
 Figure 52. Breakdown of Cream Processing Costs.....39

*We welcome your comments on this Manufacturing Cost Annual.
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Introduction

The California Food and Agricultural Code specifies that the Department of Food and Agriculture (Department) must consider manufacturing costs in determining appropriate minimum prices for products categorized as Class 4a (butter, skim whey powder and dried milk products) and Class 4b (cheese). To comply with the legislative decree, the Department has a direct need for gathering and summarizing information provided in the cost studies to formulate reasonable manufacturing cost (make) allowances through the public hearing process.

The Department maintains a Manufacturing Cost Unit that collects and summarizes cost data from California dairy manufacturing plants. Any plant that produces Class 4a or Class 4b products may be asked to participate in the cost studies. Information gathered in the studies provides an accurate sampling of California's annual butter, nonfat dry milk (NFDM), skim whey powder, and Cheddar cheese production. Study participants typically account for over 92 percent of the products manufactured in California. Data on cream and condensed skim is collected concurrently from plants that participate. Plants that manufacture cream and condensed skim but do not manufacture butter, NFDM, skim whey powder or Cheddar cheese are not included in the study. As a result, data on cream and condensed skim accounts for significantly less volume.

The data from the cost studies has a practical significance beyond the boundaries of California. They are the only studies in the U.S. which present the audited and detailed processing costs of butter, NFDM, skim whey powder and Cheddar cheese plants over a period of several years. The studies are conducted by professional auditors specializing in dairy accounting practices. The auditors review plant records on-site and work with plant management to collect data on all aspects of the operation. The auditors also determine allocations of plant expenditures for each product manufactured by the plant. For the plants in the study, the results can help to isolate the actual costs of manufacturing and give benchmark figures obtained from other California manufacturing plants. Consequently, although the Department has the legal authority to collect cost information from the various types of milk processing plants, most plants find the study and resulting comparisons valuable and cooperate in the cost studies voluntarily.

Highlights of the Manufacturing Cost Studies

Each plant in the study gave access to cost data for a 12-month period January 2005 to December 2005. The 2005 cost studies include data obtained from 8 butter plants, 9 NFDM plants, 3 skim whey powder plants, 7 Cheddar cheese plants, 8 condensed skim plants and 8 cream plants. This years' annual report accounts for 97.2 percent of the butter, 93.2 percent of the NFDM, 82 percent of the skim whey powder, and 96.7 percent of the total Cheddar and Monterey Jack cheese produced in California. Since about half the plants process and sell bulk cream and /or condensed skim, data was also accumulated for these products.

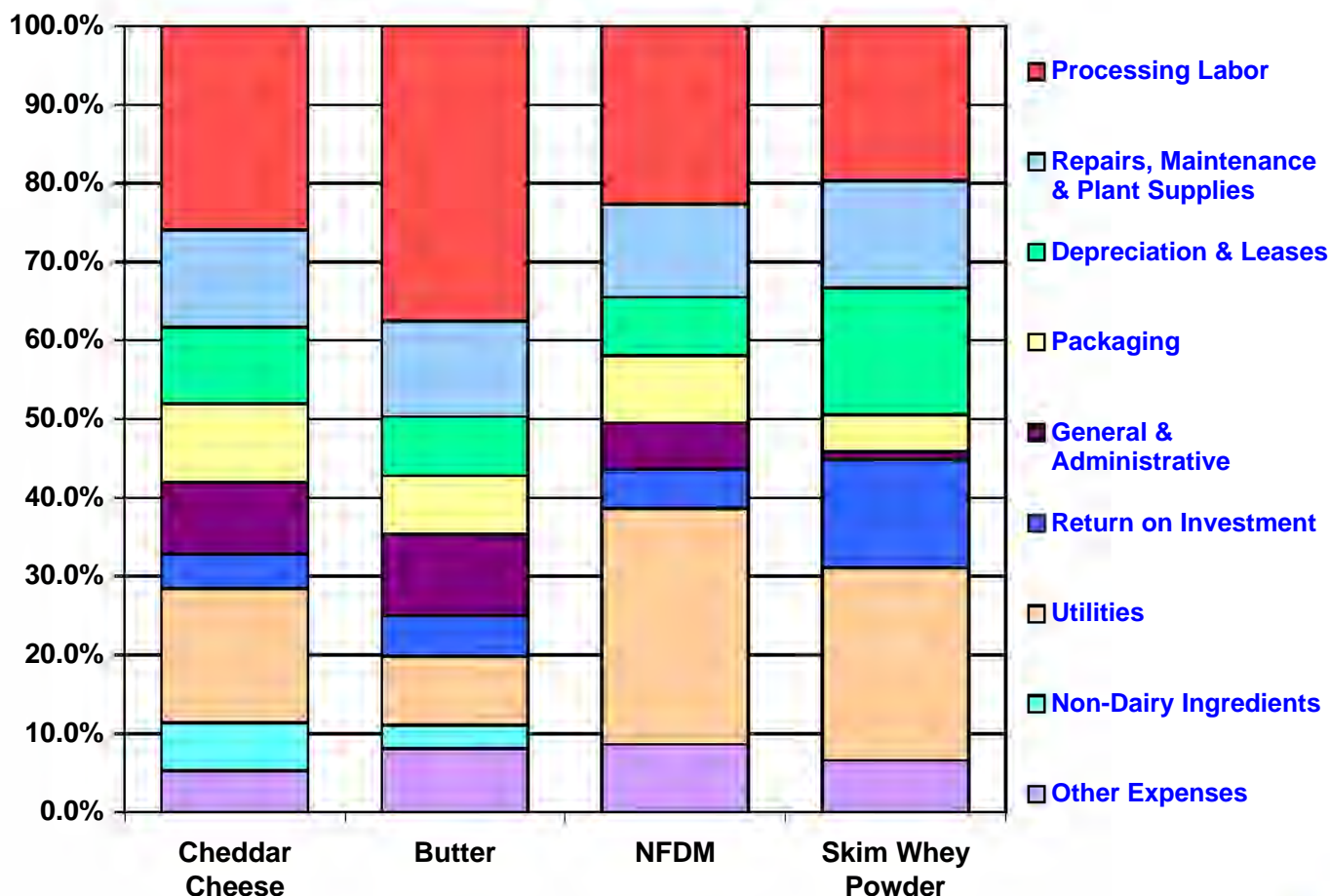


Labor Was the Largest Cost Component

The largest single category contributing to overall processing costs for most of the studies was labor (Figure 1). Labor was on average 37 percent of total butter processing costs, 23 percent of NFDM processing costs, 26 percent of Cheddar cheese processing costs, and 20 percent of skim whey powder processing cost. The dollar impact of other cost categories varied by product type. Utility costs accounted for 30 percent of NFDM processing costs, 9 percent of butter processing costs, 17 percent of Cheddar cheese processing costs, and 24 percent of skim whey powder processing costs. Depreciation and lease expenses account for 9 percent of Cheddar cheese processing costs, 8 percent of butter processing costs, 8 percent of NFDM processing costs, and 17 percent of total skim whey powder processing costs.

This publication is divided into sections identified by product, e.g., Cheddar Cheese, Butter, NFDM, Skim Whey Powder, and includes an added section containing Condensed Skim and Cream processing information. Within each section a summary table is included to describe categorized processing costs, and bar charts identify the distribution of costs among the study plants. Pie charts are also utilized to detail the overall contribution of individual cost categories to the overall cost structure.

Figure 1. Comparison of Costs by Category for California Manufacturing Plants





Cheese Study



Cost studies were completed on seven cheese plants for 2005. Each plant was assigned to one of two cost groups based on total processing costs. While calculations were derived from 40 lb. block Cheddar cheese products only, the plants typically manufacture other cheese products and a variety of by-products (Figure 2). The cost summary statistics displayed provide a quantitative profile of California's Cheddar cheese production, including production statistics, processing costs per pound, and cheese vat information (Tables 1 and 2).

- The data indicates that the lower cost Cheddar plants in the state tended to be the large production plants. Specifically, the three lowest cost plants produced 57 percent of California's Cheddar and Jack cheese in 2005.
- Labor costs were the single largest expense contributing to the overall cost of production. Processing labor ranged from 4.1¢ per pound in the low cost group to 6.2¢ per pound in the high cost group.
- Processing non-labor costs were larger than labor costs but included several different plant expenses within the category, such as utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance. Surprisingly, the high cost group managed an average non-labor cost of 8.0¢ per pound, while the low cost group averaged an 11 percent higher cost of 8.9¢ per pound.
- The return on investment (ROI) allowance is calculated by subtracting accumulated depreciation from the original cost of the fixed assets. The remaining book value is multiplied by the Moody's "BAA" corporate bond index. This figure is then allocated to the products in the plant based on the same methods used to allocate depreciation expense.
- The ROI allowance is an opportunity cost and represents how much interest the company could have earned if its capital was not tied up in land, buildings and equipment. In other words, it is viewed as an alternative source of income had the company invested the capital elsewhere. A higher ROI cost suggests that either a plant is relatively new with little accumulated depreciation of its assets (high book value) or that it is an established plant with low production volume.
- Packaging costs varied as much as 38 percent when comparing the high cost group's 1.6¢ cost per pound with that of the low cost group's 2.2¢ cost per pound.
- The high cost group's vat yield was less than the low cost group's (Table 2); however, the low cost group's vat fat and solid not fat content tested higher.

Table 1. Processing Costs for Seven California Cheddar Cheese Plants

CHEESE MANUFACTURING COSTS

CURRENT Study Period: January through December 2005
With Comparison to the same time period PRIOR YEAR (2004)

- Manufacturing cost data were collected and summarized from seven California cheese plants. The seven plants processed 826 million pounds of cheese during the 12-month study period, January through December 2005, representing 96.7% of the Cheddar and Monterey Jack cheese processed in California.
- The volume total includes both Cheddar and Monterey Jack cheeses, but the costs reflect only costs for 40 lb. blocks of Cheddar.
- Three plants processed 500-lb. barrels or 640-lb. blocks. Packaging costs and packaging labor for 40-lb. blocks were substituted for these plants.
- To obtain the weighted average, individual plant costs were weighted by their cheese processing volume relative to the total volume of cheese processed by all plants included in the cost study.
- For all cheese: the weighted average yield was 11.89 lbs. of cheese per hundredweight of milk. The weighted average moisture was 37.22% and weighted average vat tests were 4.35% fat and 9.30% SNF.
 - For 40-lb. blocks: the weighted average yield was 12.20 lbs. of cheese per hundredweight of milk. The weighted average moisture was 38.04% and weighted average vat tests were 4.29% fat and 9.17% SNF.
- For this study period, approximately 0% of the cheese was processed at a cost less than the current manufacturing cost allowance for cheese of \$0.178 per pound.

Breakdown of Cheese Manufacturing Costs - January through December 2005

Categories	Low Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2005	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2004	Actual Difference Current Less Prior Year
			Minimum	Maximum			
<i>Dollars Per Pound of Cheese</i>							
Number of Plants	3	4	7	7	7	7	--
Processing Labor	\$0.0413	\$0.0621	\$0.0378	\$0.0739	\$0.0498	\$0.0469	\$0.0029
Processing Non-Labor	\$0.0887	\$0.0796	\$0.0570	\$0.0910	\$0.0850	\$0.0719	\$0.0131
Packaging	\$0.0215	\$0.0162	\$0.0126	\$0.0231	\$0.0193	\$0.0186	\$0.0007
Other Ingredients	\$0.0099	\$0.0143	\$0.0074	\$0.0287	\$0.0117	\$0.0110	\$0.0007
General & Administrative	\$0.0188	\$0.0154	\$0.0083	\$0.0303	\$0.0174	\$0.0203	-\$0.0029
Return on Investment	\$0.0077	\$0.0090	\$0.0028	\$0.0125	\$0.0082	\$0.0082	\$0.0000
Average Total Cost	\$0.1879	\$0.1966	--	--	\$0.1914	\$0.1769	\$0.0145
Volumn in Group (Lbs.)	488,770,657	337,812,843	--	--	826,583,500	817,068,328	--
% Volume by Group	59.1%	40.9%	--	--	100.0%	100.0%	--

Processing Labor: Labor costs associated with processing of product, including wages, payroll taxes and fringe benefits.

Processing Non-Labor: Includes costs such as utilities, repairs and maintenance, laundry, supplies, depreciation, plant insurance, and rent.

Packaging: Includes all non-reusable items used in the packaging of the product, such as boxes, bags, cartons, liners, tape, glue and stretch wrap.

Other Ingredients: Includes salt, color, and rennet.

General & Administrative: Includes expenses in the management of the company, such as: office supplies, short-term interest, dues and subscriptions, accounting fees, headquarter charges, office clerical wages and executive salaries.

Return on Investment: Calculated by subtracting accumulated depreciation from the original cost of assts, with the remaining book value multiplied by Moody's "BAA" corporate bond index.

Table 2. Cheddar Cheese Production Parameters from Cost Studies¹

Cost Group	Finished Moisture %	Vat Fat Test %	Vat SNF Test %	Vat Yield (Lbs.)
Low	36.96%	4.69%	9.64%	12.84%
High	37.60%	3.86%	8.80%	10.51%
Wt'd Avg.	37.22%	4.35%	9.30%	11.89%

¹ Moisture, vat tests and yields reflect levels achieved for Cheddar cheese only.

Characteristics of Cheddar Cheese Plants

In the following section, summary statistics provide an indication of how much variation exists among plants producing Cheddar cheese. The “weighted average” is weighted by pounds of cheese produced, and the “median” is a midpoint in the data indicating a point at which half of the plants are above and half are below a given figure.

Column charts are used throughout this section to show the distribution of the plants within a specified category or the breakdown of costs. Charts provide an indication of how much variation exists among the plants and the relative impact that individual cost categories have upon production.

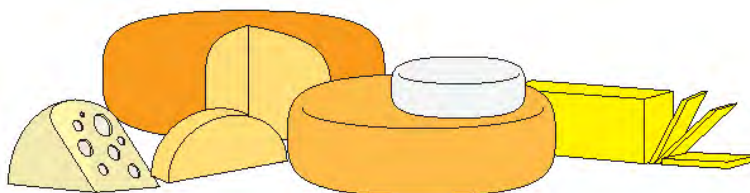


Figure 2. Simplified Product Flow in a Cheese Plant with By-Product Processing

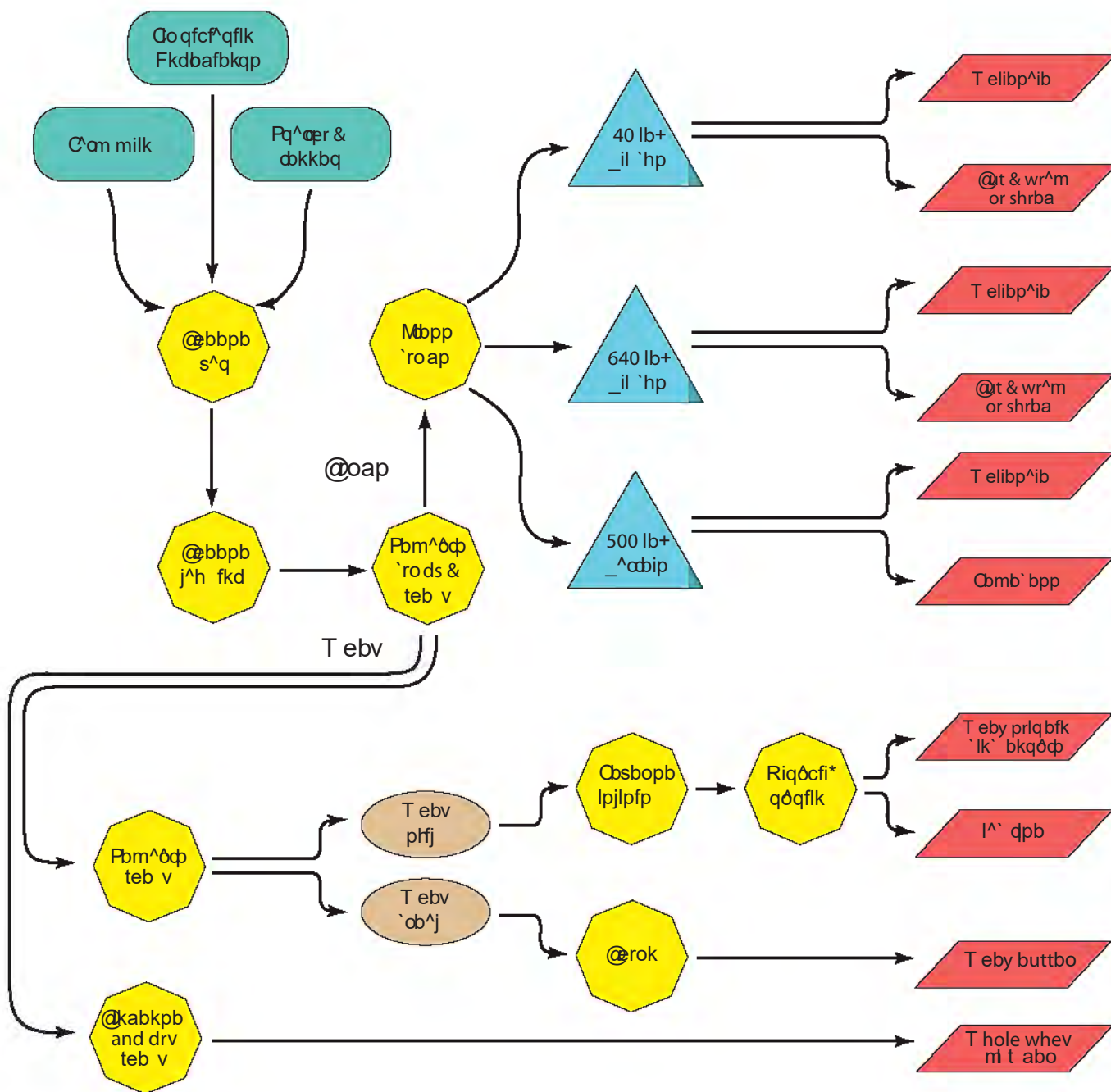


Figure 3. Breakdown of Cheddar Cheese Processing Costs

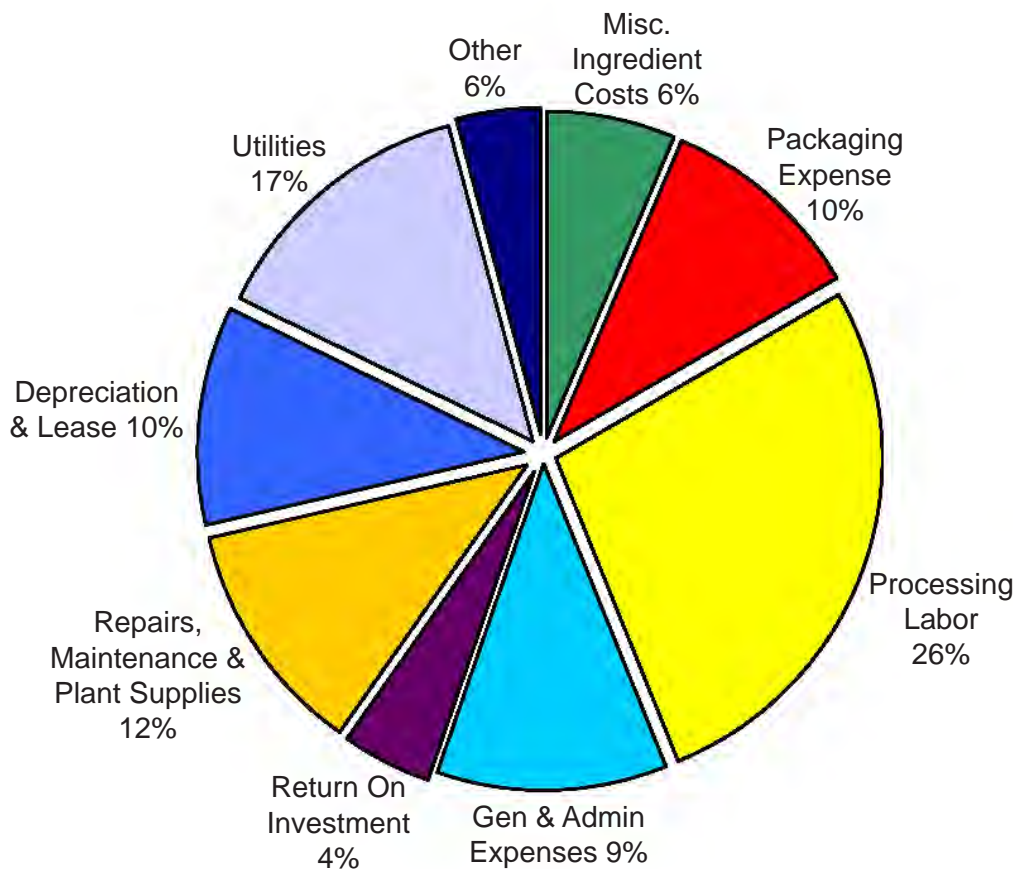


Figure 4. Breakdown of Cheddar Cheese Packaging Sizes

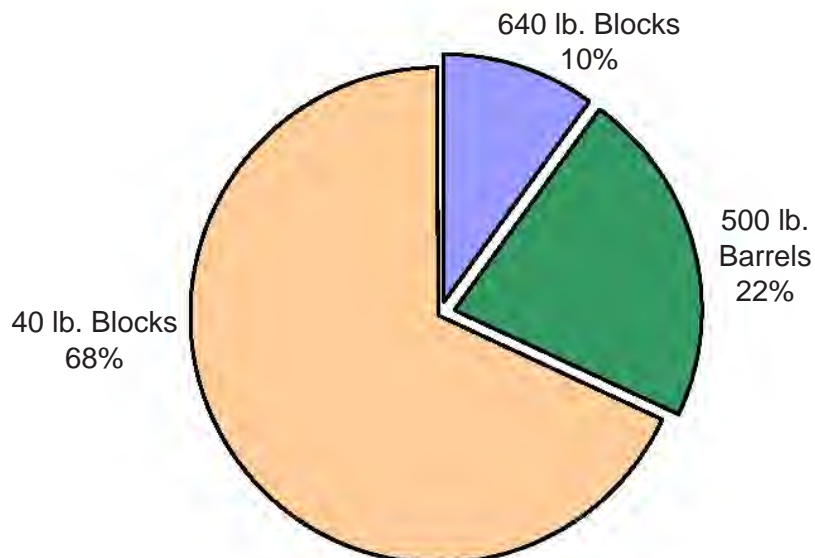
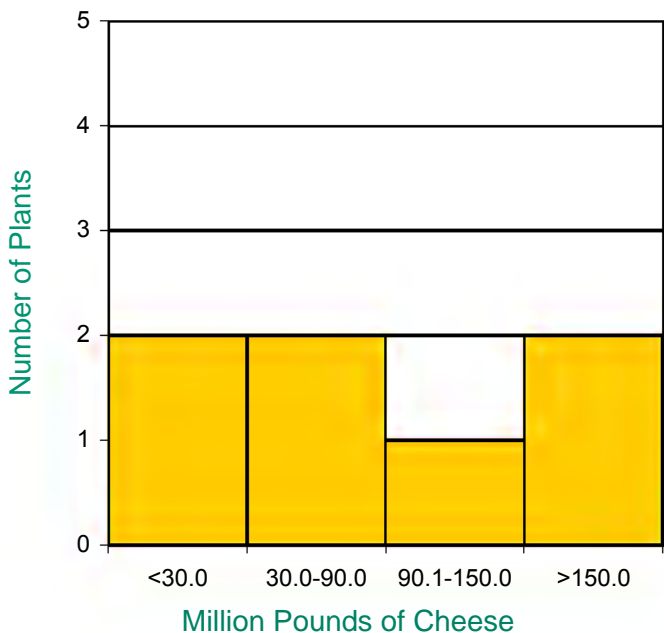


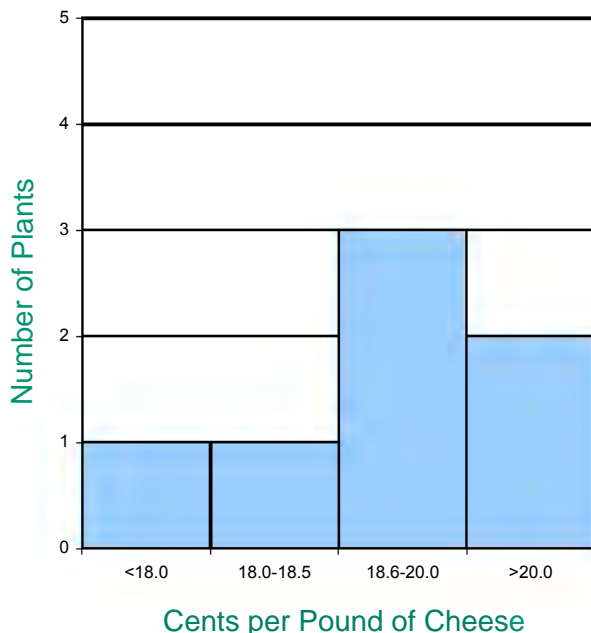
Figure 5. Annual California Cheddar and Jack Cheese Production



Average = 118 million pounds
 Median = 85 million pounds
 Average of low 3 = 489 million pounds
 Average of high 4 = 338 million pounds

- Two plants produced over 180 million pounds.
- Three of the seven plants produced less than 50 million pounds each.

Figure 6. Manufacturing Cost per Pound



Average = 19.2¢ per pound
 Wt'd Average = 19.1¢ per pound
 Median = 19.3¢ per pound
 Average of low 3 = 18.8¢ per pound
 Average of high 4 = 19.7¢ per pound

- In general, larger plants had lower costs per pound than smaller plants.
- Cost per pound ranged from 18¢ per pound to greater than 21¢ per pound.
- Five plants kept manufacturing costs under 20¢ per pound.

Figure 7. Share of California Cheddar and Jack Cheese Production by Ownership Type and by Workforce Type

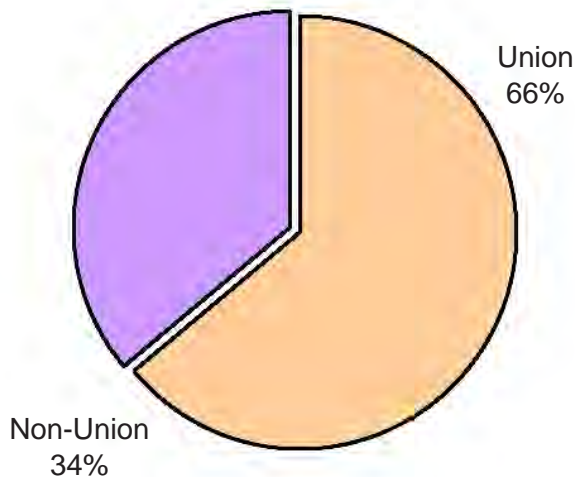
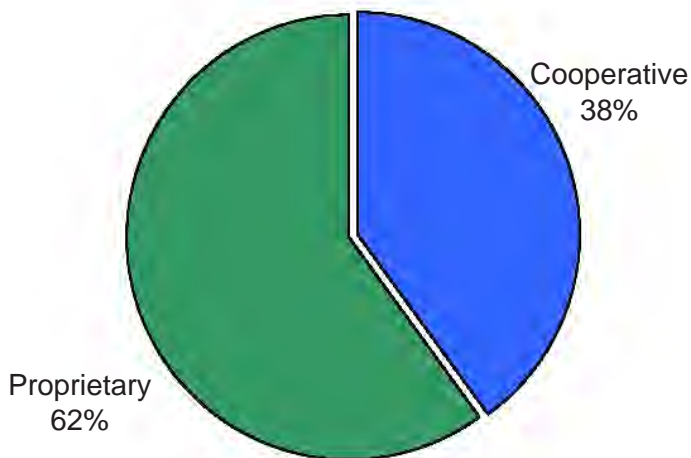
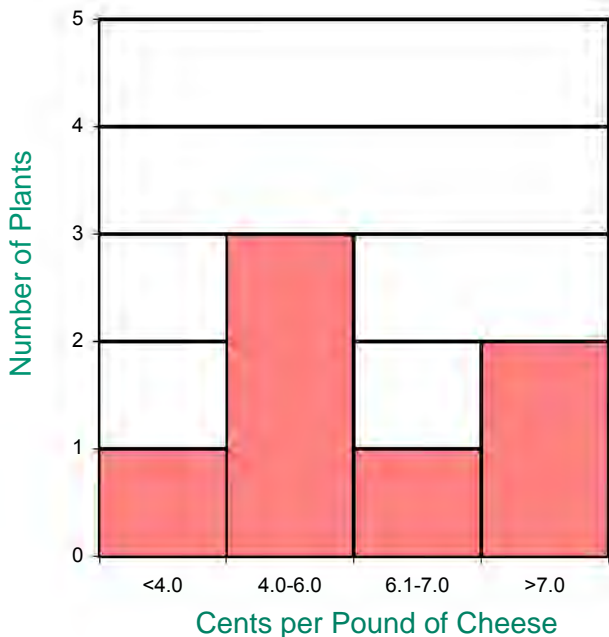


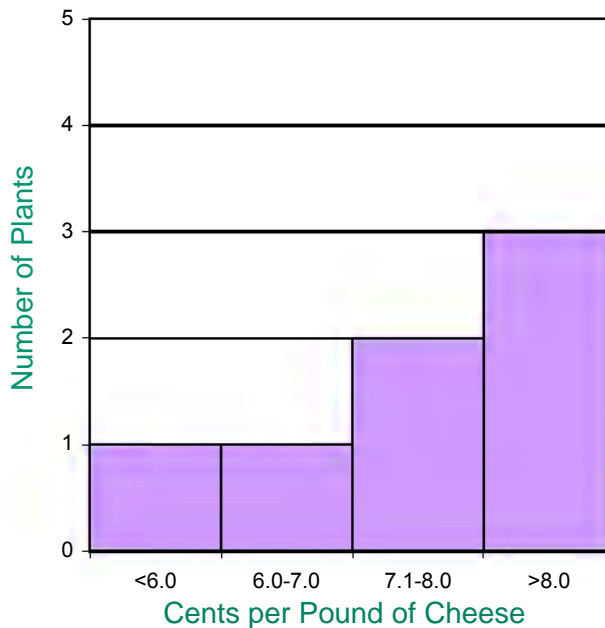
Figure 8. Processing Labor Cost per Pound



Average	=	5.7¢ per pound
Wt'd Average	=	5.0¢ per pound
Median	=	6.0¢ per pound
Average of low 3	=	4.1¢ per pound
Average of high 4	=	6.2¢ per pound

- Three plants had labor costs ranging from 4¢ to 6¢ per pound.
- The average labor cost per pound for the high 4 plants was 51% higher than the average labor cost for the low 3 plants.
- Simple average labor costs were 5.7¢ per pound, whereas the weighted average cost based on production volume was 5.0¢ per pound, indicating lower costs for larger plants.

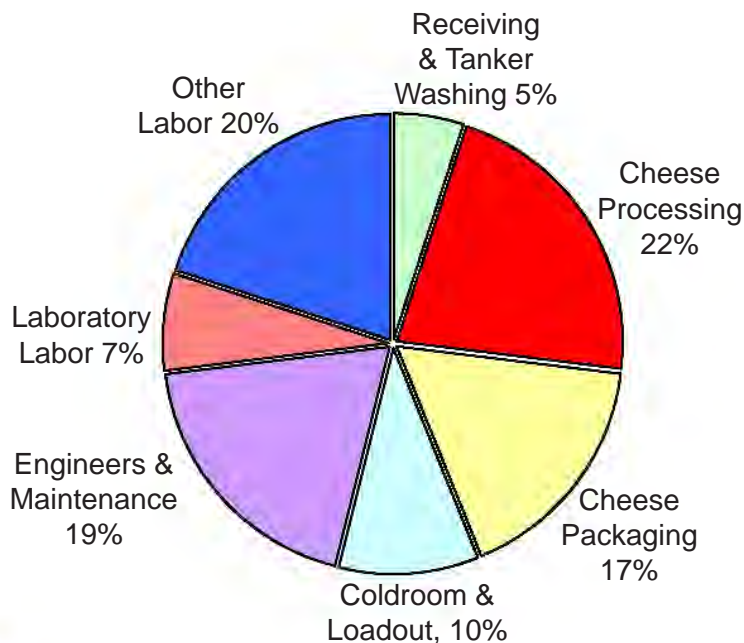
Figure 9. Processing Non-Labor Cost per Pound



Average	=	7.7¢ per pound
Wt'd Average	=	8.5¢ per pound
Median	=	7.3¢ per pound
Average of low 3	=	8.9¢ per pound
Average of high 4	=	8.0¢ per pound

- Includes utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance.

Figure 10. Cheddar Cheese Labor Breakdown by Category

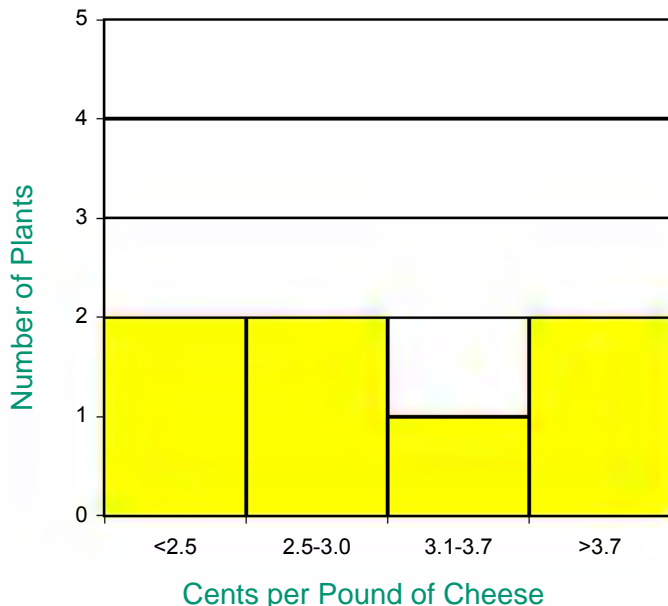


Based on detailed data:

Labor cost averaged 6.0¢ per pound
 Labor cost averaged \$2.28 per 40 lb. block

Note: "Other" includes pasteurizing, separating, plant manager/superintendent, general plant, plant clerical, and whey disposal.

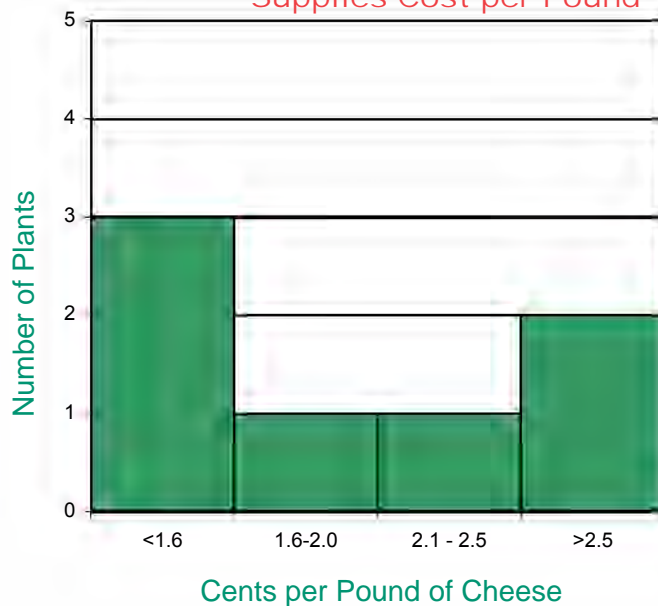
Figure 11. Utility Cost per Pound



Average	=	2.9¢ per pound
Wt'd Average	=	3.3¢ per pound
Median	=	2.8¢ per pound
Average of low 3	=	2.5¢ per pound
Average of high 4	=	3.3¢ per pound

- Utility costs ranged from 2.1¢ to 3.9¢ per pound.
- The average utility cost per pound for the highest 4 production plants was 32% more than that of the average utility cost for the low 3 plants.
- Electricity represents 29% of the utility cost while natural gas represented approximately 35%. Sewage, water, and whey disposal make up 36% of the total cost.

Figure 12. Repairs, Maintenance, and Supplies Cost per Pound



Average	=	2.2¢ per pound
Wt'd Average	=	2.4¢ per pound
Median	=	1.9¢ per pound
Average of low 3	=	1.9¢ per pound
Average of high 4	=	2.4¢ per pound

- Repairs and maintenance represent approximately 62% of the costs incurred in this category; and supplies represent 38%.
- Older plants tended to have higher per pound repair and maintenance costs.
- Repair and maintenance cost per pound of cheese ranged from .09¢ to 4.0¢ per pound. The weighted average repair and maintenance cost per pound of cheese was 2.4¢.

Figure 13: Comparison of Payroll Breakdown for Plant Employees, Hourly and Salaried

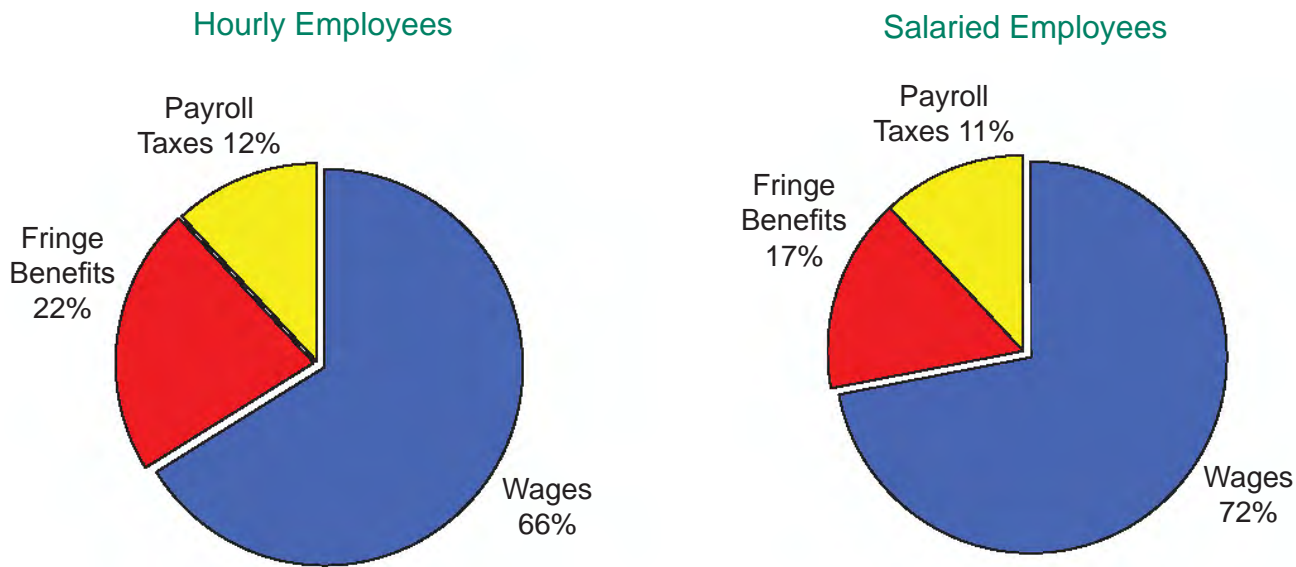
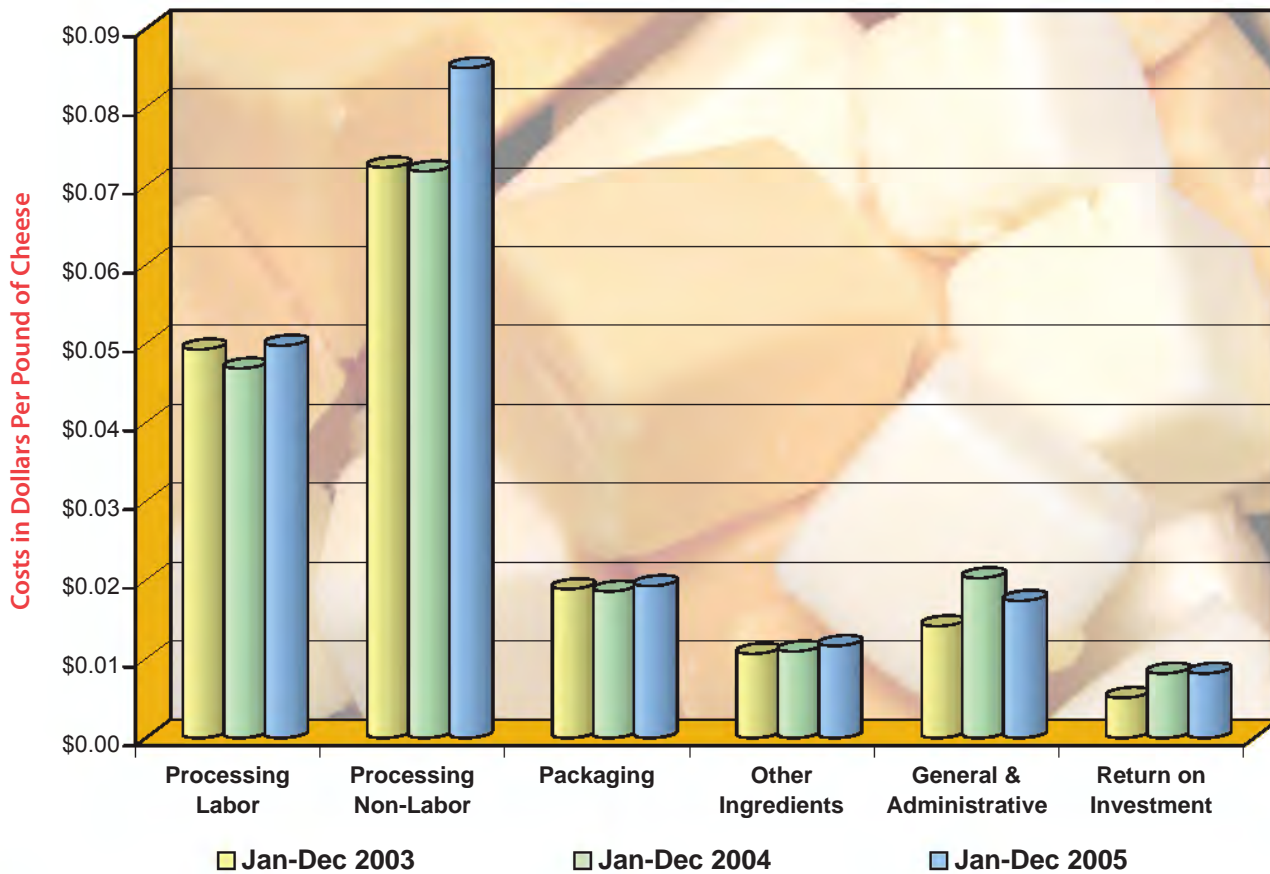


Figure 14. Cheese Processing Cost Comparison, 2003, 2004, 2005



Butter Study

Cost studies were completed on eight butter plants for 2005. Statistics indicate the per pound costs for each of the manufacturing processes (Table 3). To avoid revealing plant-specific information, the statistics displayed are based off of the total production costs. Only costs for bulk butter (25 kg and 68 lb. boxes) were analyzed although most plants produce a variety of other size packaging (Figures 17).

- To obtain the weighted average, individual plant costs were weighted by their butter processing volume relative to the total volume of butter processed by all plants involved in the exhibit.
- The data seems to indicate that the lower cost butter plants in the state tend to be plants with larger production volumes. Specifically, the four low cost plants produced 64 percent of the surveyed butter production this year.
 - Note: In 2004, the four low cost plants produced 75 percent of the surveyed butter production.
- Again this year, we see that total weighted average processing labor costs slightly exceed those of processing non-labor. However this year, the high cost group had an average processing non-labor cost of 6¢ per pound exceeding their average labor cost of 5.7¢ per pound.
- The “Processing Non-Labor” category includes costs such as utilities, repairs and maintenance, supplies, depreciation, and rent, with total costs ranging from 4.1¢ to 7.1¢ per pound.
- The return on investment (ROI) allowance is calculated by subtracting accumulated depreciation from the original cost of fixed assets. The remaining book value is multiplied by the Moody’s “BAA” corporate bond index. The amounts are then allocated to production employing the same methods used to allocate depreciation expense. In the butter studies, the total weighted average ROI cost accounts for 5.5 percent of the total weighted average cost of production.

Table 3. Processing Costs for Eight California Butter Plants**BUTTER MANUFACTURING COSTS**

CURRENT Study Period: January through December 2005
With Comparison to the same time period PRIOR YEAR (2004)

- Manufacturing cost data were collected and summarized from eight California butter plants. The eight plants processed 396.6 million pounds of butter during the 12-month study period, January through December 2005, representing 97.2% of the butter processed in California.
- The volume total includes both bulk butter and cut butter, but the costs reflect only costs for bulk butter (25 kg and 68 lb. blocks).
- To obtain the weighted average, individual plant costs were weighted by their butter processing volume relative to the total volume of butter processed by all plants included in the cost study.
- For this study period, approximately 64% of the butter was processed at a cost less than the current manufacturing cost allowance for butter of \$0.156 per pound.

Breakdown of Butter Manufacturing Costs - January through December 2005

Categories	Low Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2005	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2004	Actual Difference Current Less Prior Year
			Minimum	Maximum			
<i>Dollars Per Pound of Butter</i>							
Number of Plants	4	4	8	8	8	8	--
Processing Labor	\$0.0504	\$0.0571	\$0.0428	\$0.0973	\$0.0528	\$0.0507	\$0.0021
Processing Non-Labor	\$0.0465	\$0.0604	\$0.0407	\$0.0706	\$0.0514	\$0.0504	\$0.0010
Packaging	\$0.0103	\$0.0105	\$0.0089	\$0.0113	\$0.0104	\$0.0100	\$0.0004
Other Ingredients	\$0.0026	\$0.0068	\$0.0013	\$0.0086	\$0.0041	\$0.0040	\$0.0001
General & Administrative	\$0.0138	\$0.0162	\$0.0050	\$0.0248	\$0.0147	\$0.0151	-\$0.0004
Return on Investment	\$0.0063	\$0.0092	\$0.0019	\$0.0101	\$0.0074	\$0.0066	\$0.0008
Average Total Cost	\$0.1299	\$0.1602	--	--	\$0.1408	\$0.1368	\$0.0040
Volumn in Group (Lbs.)	255,130,195	141,497,753	--	--	396,627,948	382,931,344	--
% Volume by Group	64.3%	35.7%	--	--	100.0%	100.0%	--

Processing Labor: Labor costs associated with processing of product, including wages, payroll taxes and fringe benefits.

Processing Non-Labor: Includes costs such as utilities, repairs and maintenance, laundry, supplies, depreciation, plant insurance, and rent.

Packaging: Includes all non-reusable items used in the packaging of the product, such as boxes, bags, cartons, liners, tape, glue and stretch wrap.

Other Ingredients: Includes salt, color.

General & Administrative: Includes expenses in the management of the company, such as: office supplies, short-term interest, dues and subscriptions, accounting fees, headquarter charges, office clerical wages and executive salaries.

Return on Investment: Calculated by subtracting accumulated depreciation from the original cost of assts, with the remaining book value multiplied by Moody's "BAA" corporate bond index.

Characteristics of Butter Plants

In the following section, summary statistics provide a comparison of costs and indicate how much variation exists among the individual butter plants. Column charts are used to show the distribution of plants within a specified category or the breakdown of costs by category. Graphs give an indication of how much variation exists among the plants and the relative impact of individual cost categories.

The “weighted average” cost takes into account the proportional relevance of pounds produced, and the “median” is the middle point at which half of the plants are above and half of the plants are below a given figure.

Figure 15. Simplified Flowchart of a Butter and Nonfat Dry Milk Plant

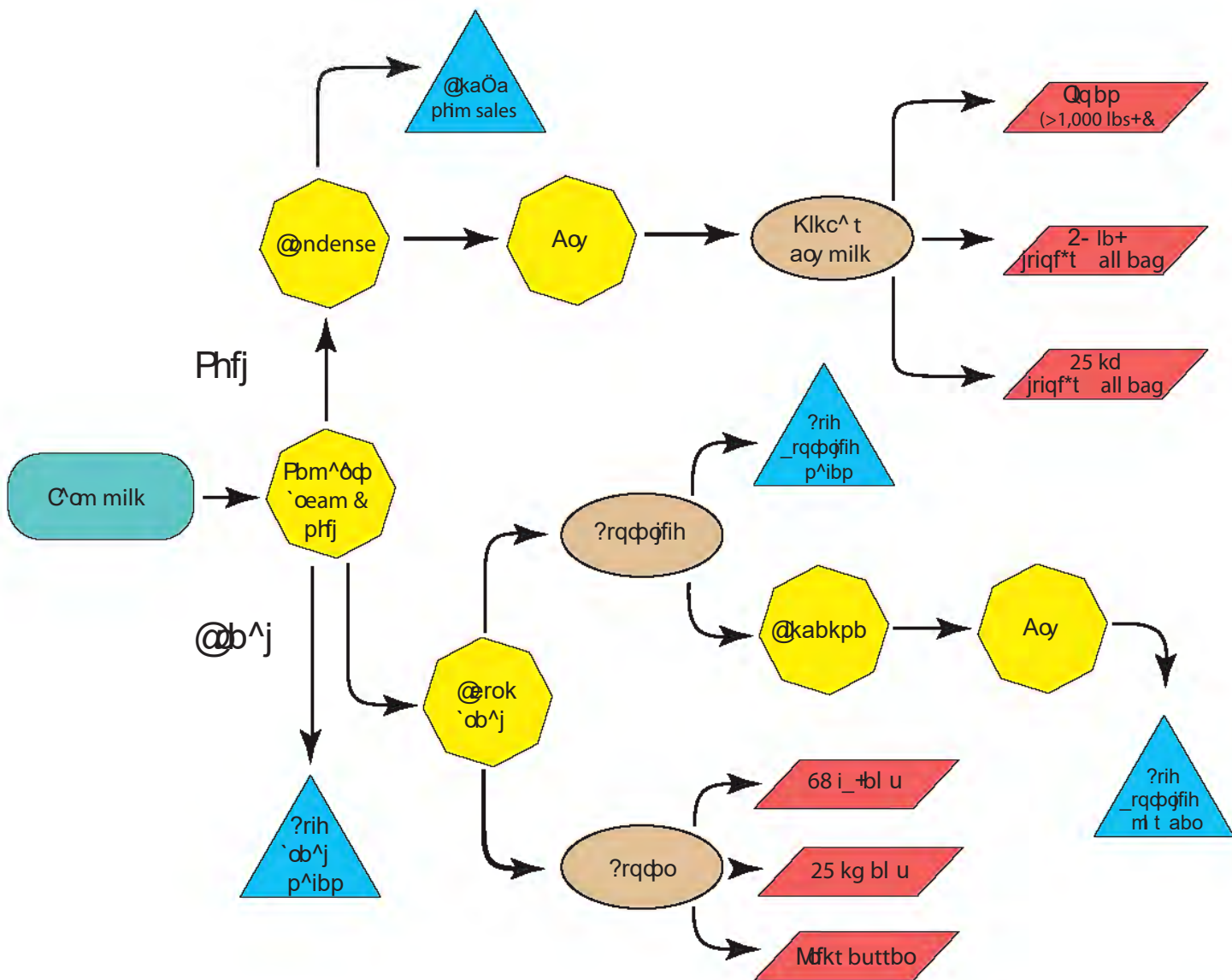


Figure 16. Breakdown of Butter Processing Costs



Figure 17. Breakdown of Butter Packaging Sizes and Types

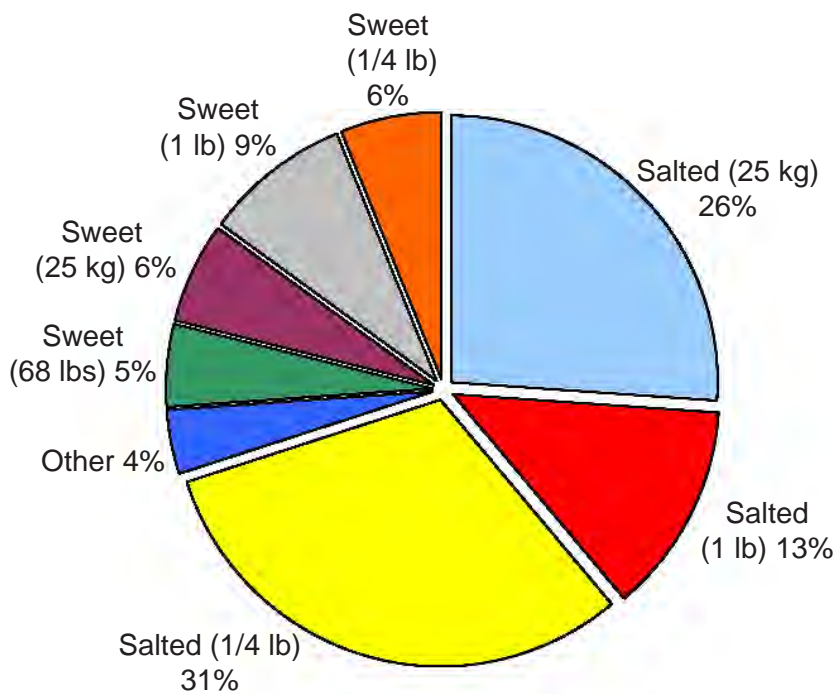
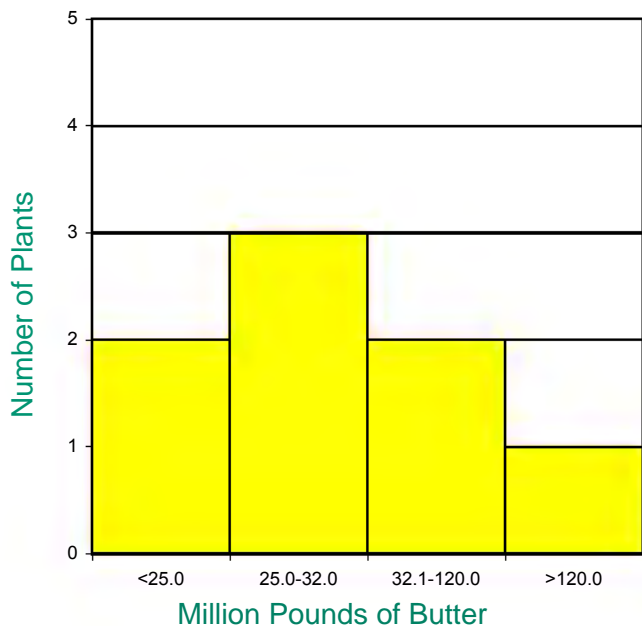


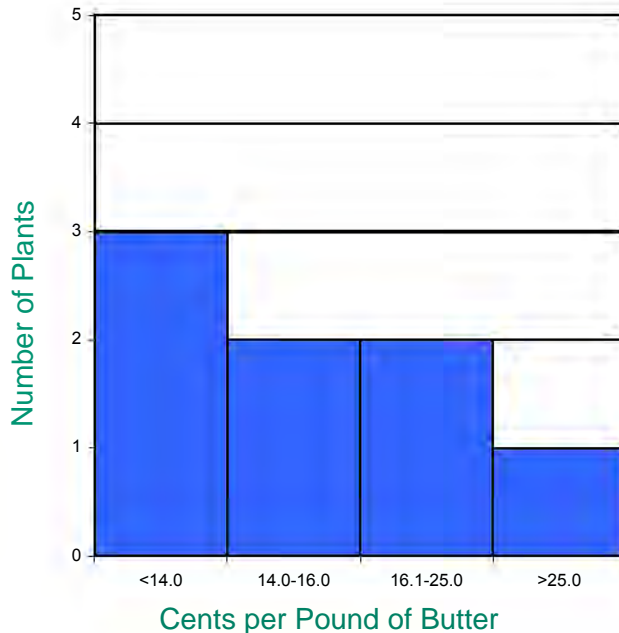
Figure 18. Annual California Butter Production



Average = 50 million pounds
 Median = 29 million pounds
 Average of low 4 = 255 million pounds
 Average of high 4 = 141 million pounds

- Six plants produced less than 60 million pounds in 2005
- Two plants produced more than 100 million pounds each for 2005.
- * The 4 highest producing plants produced 5 times more butter than the 4 smallest plants.
- The 4 plants with the lowest processing costs produced on average nearly twice as much as the plants with the highest costs.

Figure 19. Butter Manufacturing Cost per Pound



Average = 15.1¢ per pound
 Wt'd Average = 14.1¢ per pound
 Median = 15.7¢ per pound
 Average of low 4 = 13.0¢ per pound
 Average of high 4 = 16.0¢ per pound

- Three of the plants produced butter for less than 14¢ per pound.
- In general, larger butter plants tended to have lower per unit butter production costs than smaller plants.
- The average cost per pound of the high cost plants was 23% higher than that of the low cost plants.

Figure 20. Share of California Butter Production by Ownership Type and by Workforce Type

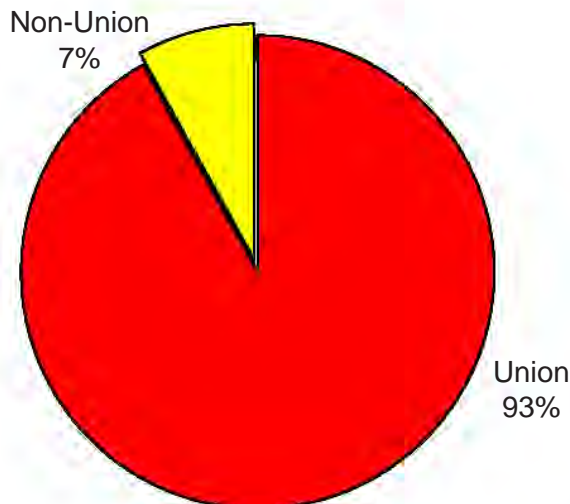
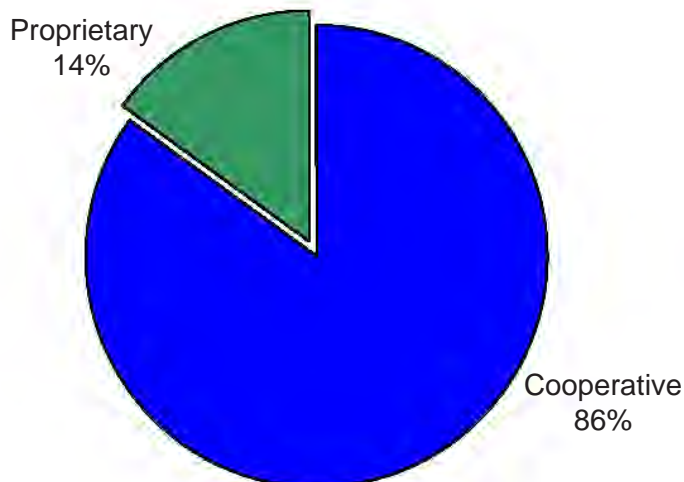
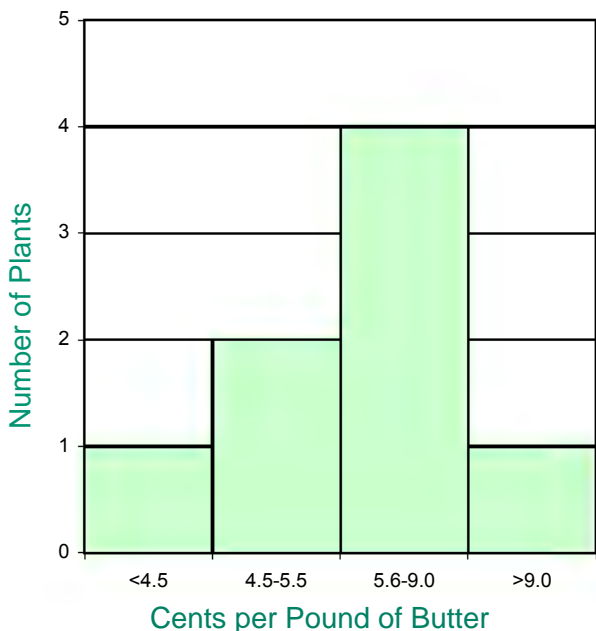


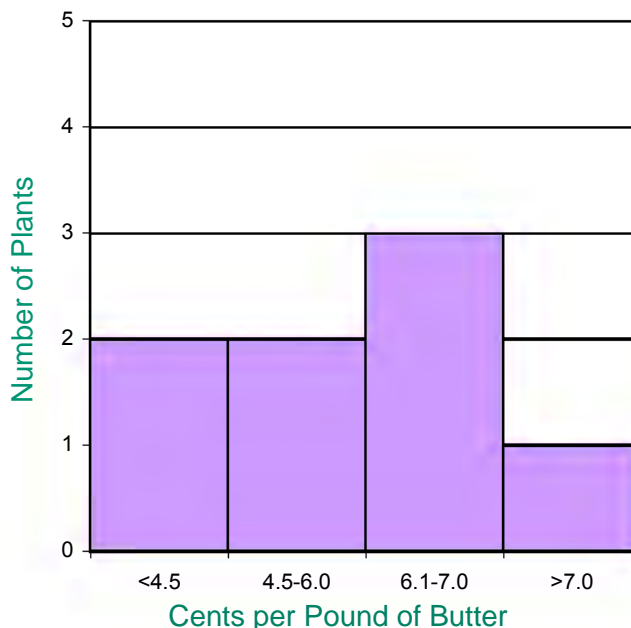
Figure 21. Processing Labor Cost per Pound



Average	=	6.0¢ per pound
Wt'd Average	=	5.3¢ per pound
Median	=	5.6¢ per pound
Average of low 4	=	5.0¢ per pound
Average of high 4	=	5.7¢ per pound

- Five plants had labor costs greater than 5.0¢ per pound.
- The average labor cost per pound for the 4 highest cost plants were only 14% higher than the average labor cost for the 4 lowest cost plants.

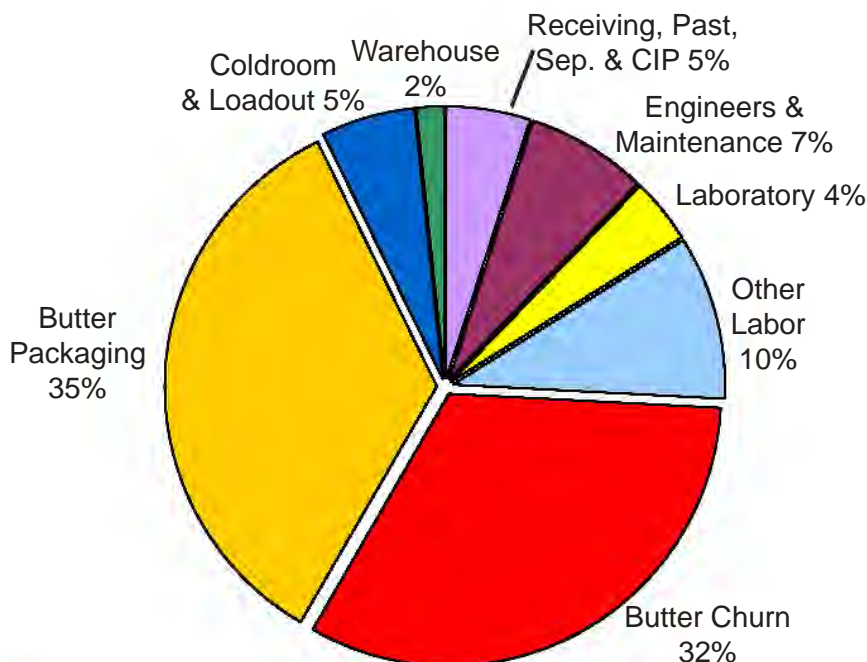
Figure 22. Processing Non-Labor Cost per Pound



Average	=	5.8¢ per pound
Wt'd Average	=	5.1¢ per pound
Median	=	6.0¢ per pound
Average of low 4	=	4.7¢ per pound
Average of high 4	=	6.0¢ per pound

- The average non-labor cost per pound for the 4 plants with the highest overall costs were 30% higher than the average of the 4 lowest cost plants.

Figure 23. Butter Labor Breakdown by Category

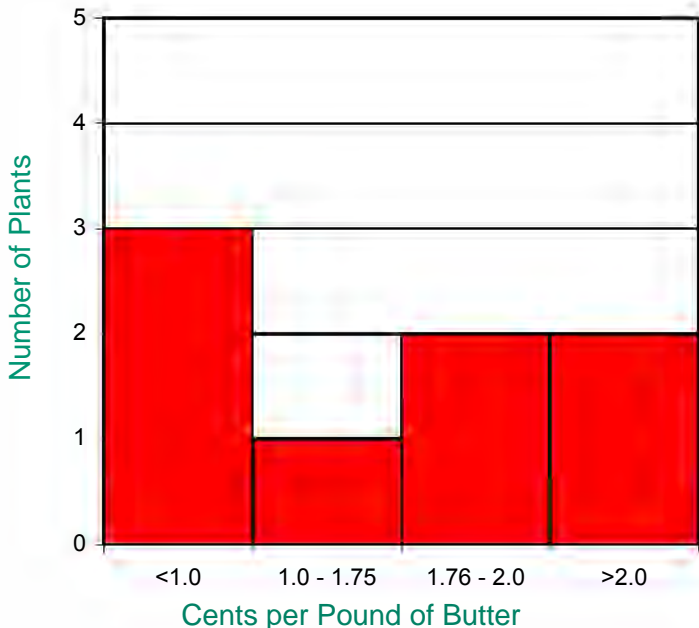


Based on detailed data:

Labor cost averaged 6.0¢ per pound
 Labor cost averaged \$3.29 per 25 kg box

Note: "Other" includes pasteurizing, separating, plant manager/superintendent, general plant, plant clerical, and whey disposal.

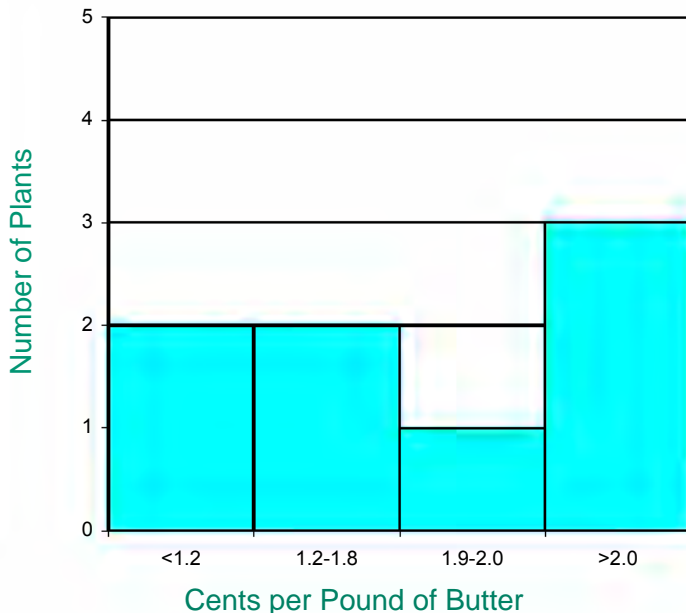
Figure 24. Utility Cost per Pound
Includes cost of natural gas, fuel oil, electricity, and sewage



Average	=	1.6¢ per pound
Wt'd Average	=	1.2¢ per pound
Median	=	1.8¢ per pound
Average of low 4	=	1.4¢ per pound
Average of high 4	=	1.8¢ per pound

- Utility costs ranged from 0.9¢ to 2.2¢ per pound.
- The average utility cost per pound for the 4 highest cost plants was 29% higher than the average utility cost for the 4 lowest cost plants.

Figure 25. Repairs, Maintenance, and Supplies Cost per Pound



Average	=	1.8¢ per pound
Wt'd Average	=	1.7¢ per pound
Median	=	1.9¢ per pound
Average of low 4	=	1.6¢ per pound
Average of high 4	=	2.0¢ per pound

- Weighing the total per pound cost of repairs, maintenance, and supplies against the total volume produced equates to a weighted average cost for repairs, maintenance, and supplies of 1.7¢ per pound.
- Four plants had costs of more than 1.9¢ per pound.
- Low cost plants, on average, managed to keep repairs, maintenance and supplies costs to only 1.6¢ per pound.

Figure 26: Comparison of Payroll Breakdown for Plant Employees and Salaried Employees

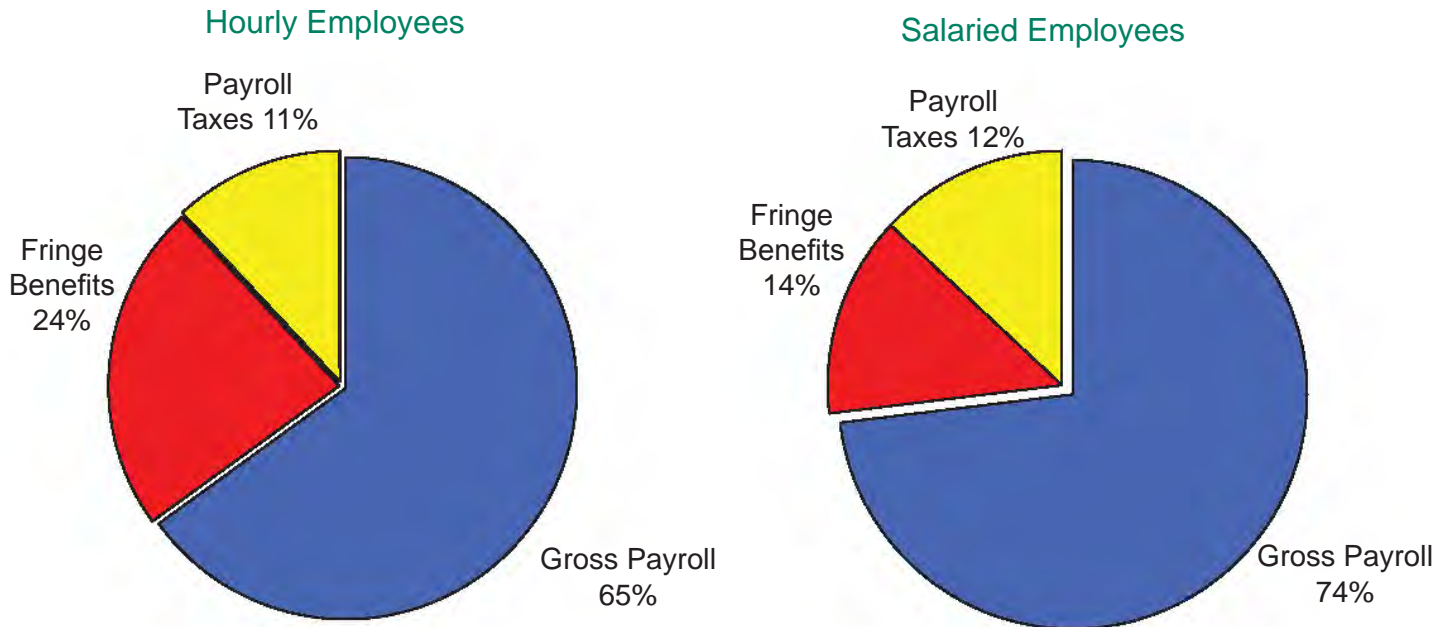
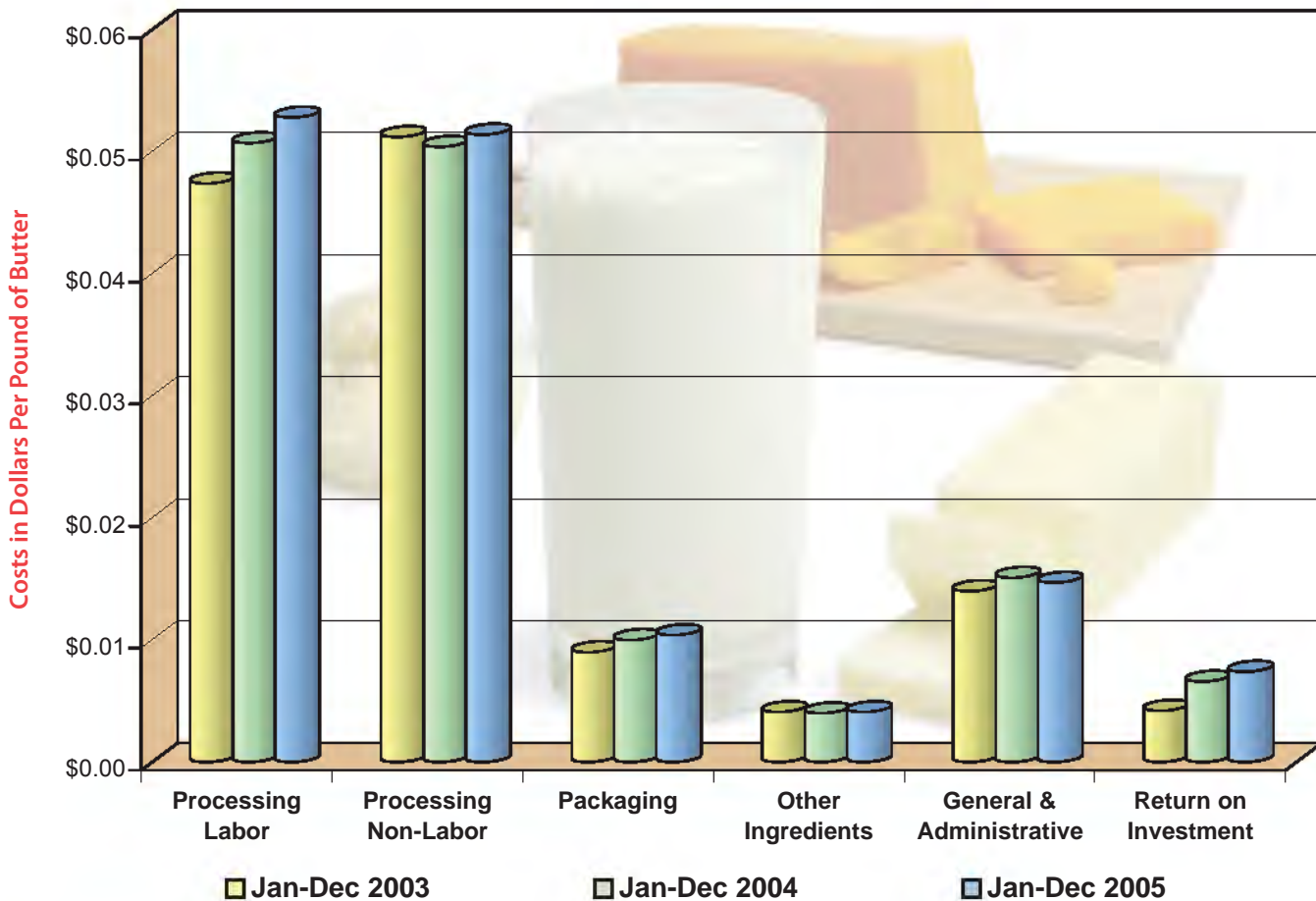


Figure 27. Butter Processing Cost Comparison, 2003, 2004, 2005



Nonfat Dry Milk Study

Cost studies were completed on nine nonfat dry milk (NFDM) plants for 2005. Plant cost summary statistics based on the study plants give an indication of plant size and per pound processing costs for the various categories (Table 4). To avoid revealing plant-specific information, the nine plants were assigned to one of three groups according to total processing cost. Only costs for bagged NFDM were analyzed although high-volume totes are becoming more common in some plants (Figures 30 and 32).

- The data indicates that the lower cost NFDM plants in the state tended to be the larger plants. Specifically, the three low cost plants in the study produced 74 percent of the NFDM studied.
- Labor costs were significant. Processing labor ranged from a weighted average of 3.2¢ per pound in the low cost group to an average of 7.9¢ per pound in the high cost group, a difference of 147 percent.
- Processing non-labor costs were larger than labor costs but included several different plant expenses, such as utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance. The combined costs of which ranged from 9.0¢ per pound in the low cost group, to 12.8¢ per pound in the high cost group.
- The return on investment (ROI) allowance is calculated by subtracting accumulated depreciation from the original cost of fixed assets. The remaining book value is multiplied by the Moody's "BAA" corporate bond index. The amounts are then allocated to the products in the plant based on the same methods used to allocate depreciation expense. ROI costs for the nine NFDM plants were on average 1.16¢ per pound.

Table 4. Processing Costs for Ten California Nonfat Dry Milk Plants**NONFAT POWDER MANUFACTURING COSTS**

CURRENT Study Period: January through December 2005
With Comparison to the same time period PRIOR YEAR (2004)

- Manufacturing cost data were collected and summarized from nine California nonfat powder plants. The nine plants processed 471.8 million pounds of nonfat powder during the 12-month study period, January through December 2005, representing 93.18% of the nonfat powder processed in California.
- The volume total includes all grades of nonfat powder packaged in any container size, but the costs reflect only costs for 25 kg and 50 lb. bags of nonfat powder.
- To obtain the weighted average, individual plant costs were weighted by their nonfat powder processing volume relative to the total volume of nonfat powder processed by all plants included in the cost study.
- For this study period, approximately 74% of the nonfat powder was processed at a cost less than the current manufacturing cost allowance for nonfat powder of \$0.160 per pound.

Breakdown of Nonfat Powder Manufacturing Costs - January through December 2005

Categories	Low Cost Group	Medium Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2005	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2004	Actual Difference Current Less Prior Year
				Minimum	Maximum			
<i>Dollars Per Pound of Nonfat Powder</i>								
Number of Plants	3	3	3	9	9	9	10	--
Processing Labor	\$0.0320	\$0.0433	\$0.0787	\$0.0289	\$0.1579	\$0.0377	\$0.0342	\$0.0035
Processing Non-Labor	\$0.0899	\$0.1078	\$0.1280	\$0.0815	\$0.3155	\$0.0961	\$0.0872	\$0.0089
Packaging	\$0.0148	\$0.0133	\$0.0115	\$0.0098	\$0.0158	\$0.0143	\$0.0143	\$0.0000
General & Administrative	\$0.0091	\$0.0119	\$0.0098	\$0.0071	\$0.0545	\$0.0096	\$0.0106	-\$0.0010
Return on Investment	\$0.0072	\$0.0109	\$0.0119	\$0.0042	\$0.0283	\$0.0082	\$0.0080	\$0.0002
Average Total Cost	\$0.1530	\$0.1872	\$0.2399	--	--	\$0.1659	\$0.1543	\$0.0116
Volume in Group (Lbs.)	349,852,650	84,374,618	37,667,191	--	--	471,894,459	745,398,915	--
% Volume by Group	74.1%	17.9%	8.0%	--	--	100.0%	100.0%	--

Processing Labor: Labor costs associated with processing of product, including wages, payroll taxes and fringe benefits.

Processing Non-Labor: Includes costs such as utilities, repairs and maintenance, laundry, supplies, depreciation, plant insurance, and rent.

Packaging: Includes all non-reusable items used in the packaging of the product, such as boxes, bags, cartons, liners, tape, glue and stretch wrap.

General & Administrative: Includes expenses in the management of the company, such as: office supplies, short-term interest, dues and subscriptions, accounting fees, headquarter charges, office clerical wages and executives salaries.

Return on Investment: Calculated by subtracting accumulated depreciation from the original cost of assets, with the remaining book value multiplied by Moody's "BAA" corporate bond index.

Characteristics of Nonfat Dry Milk Plants

Cost studies were completed on nine nonfat dry milk (NFDM) plants for 2005. Plant cost summary statistics based on the study indicate plant size and per pound processing costs for the various categories (Table 4). To avoid revealing plant-specific information, the nine plants were assigned to one of two groups according to their total processing costs. Along with this, averages are provided as comparison figures. The weighted average is weighted by pounds of NFDM produced, and the “median” indicates the point at which half of the plants above and half of the plants are below a given figure.

Throughout this section, column charts are used to show the distribution of plants within a specified category or the breakdown of costs by category. The charts give an indication of how much variation exists among the plants and the relative impact of individual cost categories upon production.

Figure 28. Simplified Flowchart of a Butter and Nonfat Dry Milk Plant

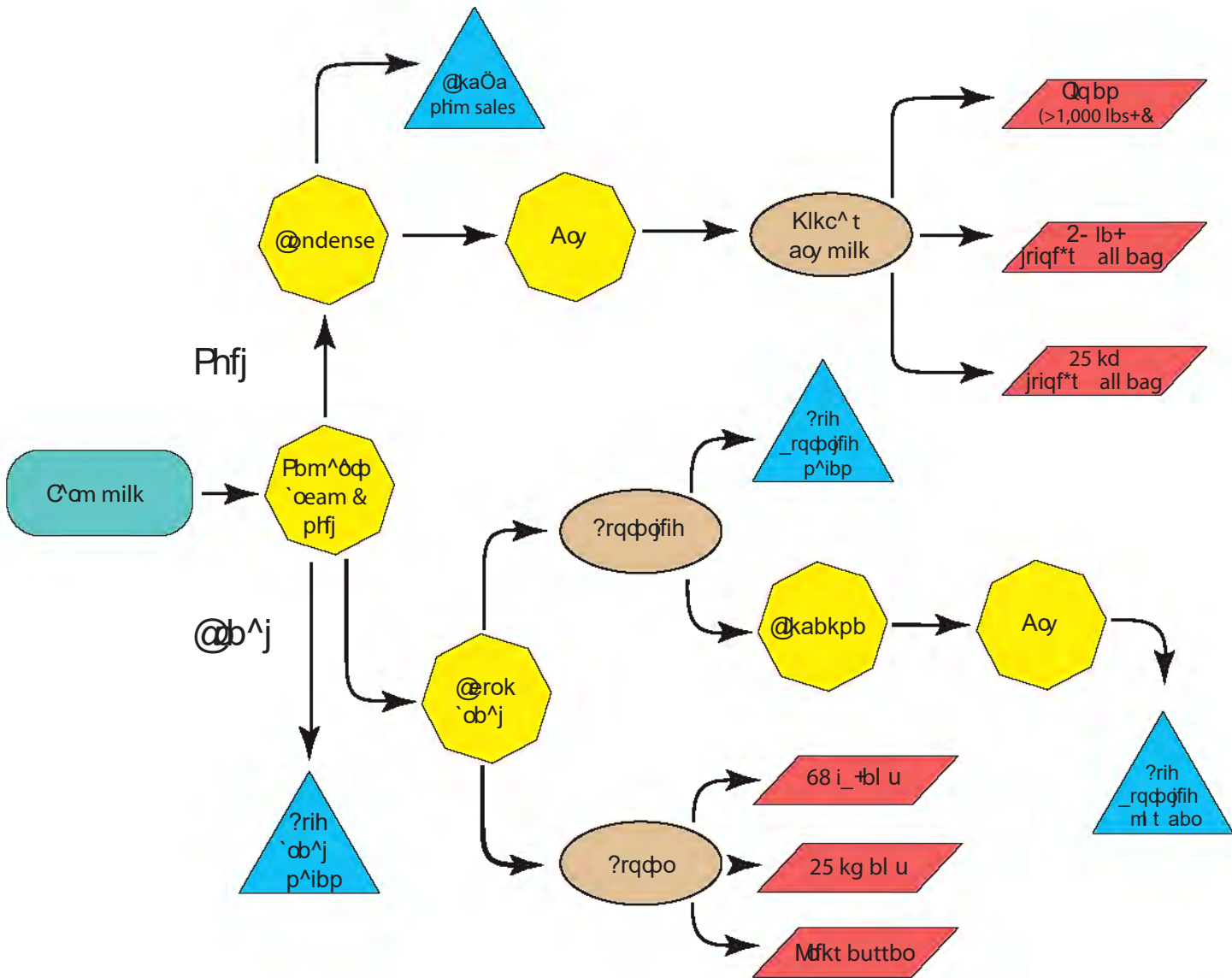


Figure 29. Breakdown of Nonfat Dry Milk Processing Costs

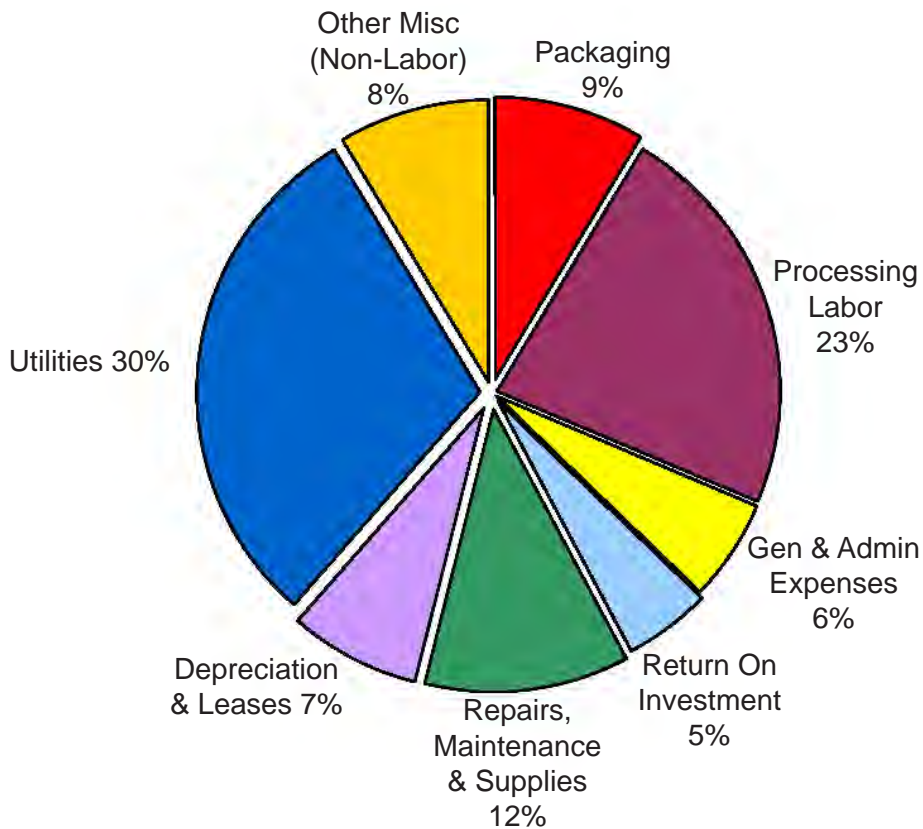


Figure 30. Breakdown of Nonfat Dry Milk Packaging Sizes

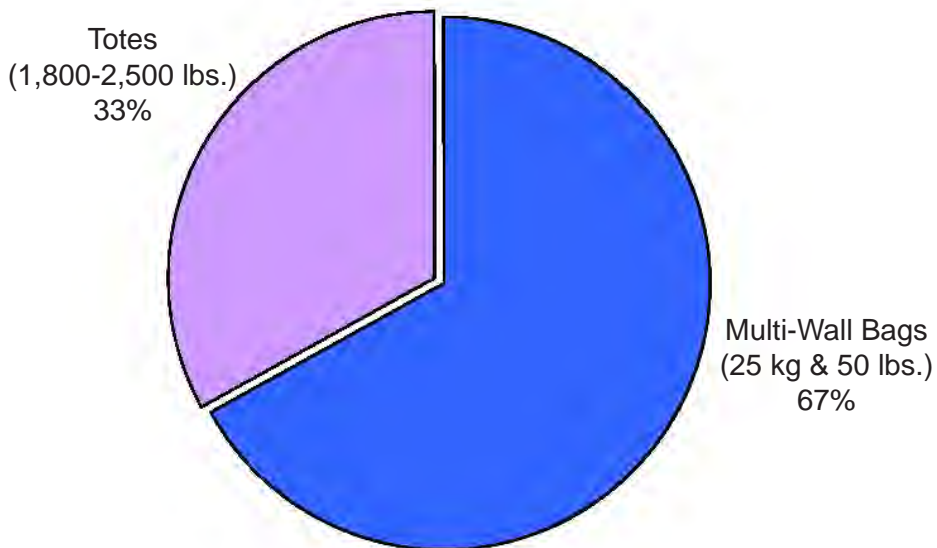
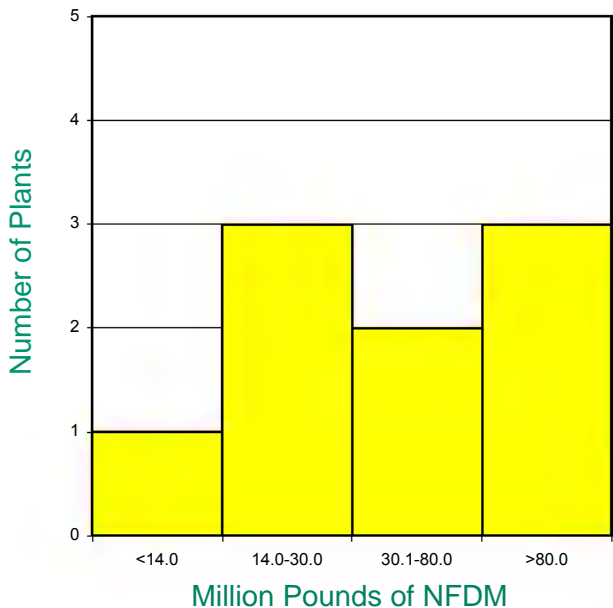


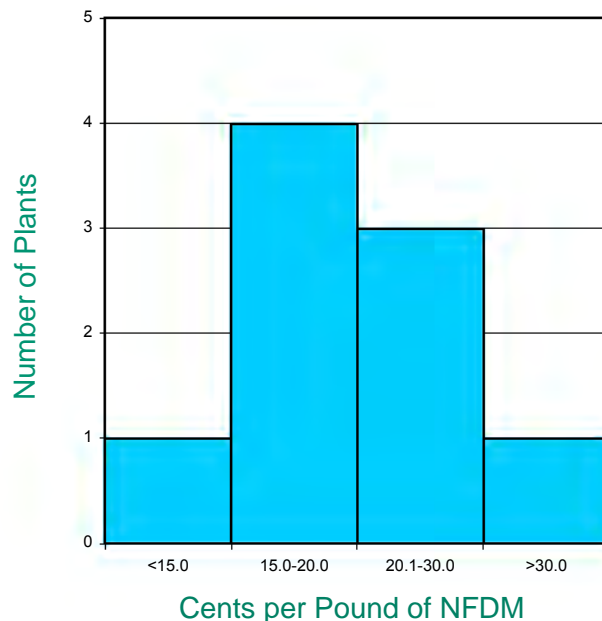
Figure 31. Annual California Nonfat Dry Milk Production



Average = 52 million pounds
 Median = 31 million pounds
 Average of low 3 = 350 million pounds
 Average of high 3 = 38 million pounds

- Three plants whose combined production represented 74% of the total NFDM production produced nearly 9 times more NFDM than the three smallest plants.

Figure 32. NFDM Manufacturing Cost per Pound



Average = 22.5¢ per pound
 Wt'd Average = 16.6¢ per pound
 Median = 17.5¢ per pound
 Average of low 3 = 15.3¢ per pound
 Average of high 3 = 24.0¢ per pound

- Three plants produced NFDM for less than 16¢ per pound, while four plants produced NFDM for more than 21¢ per pound.

Figure 33. Share of California Nonfat Dry Milk Production by Ownership Type and by Workforce Type

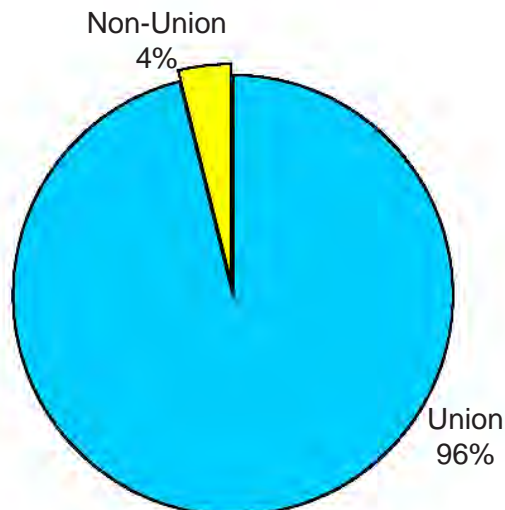
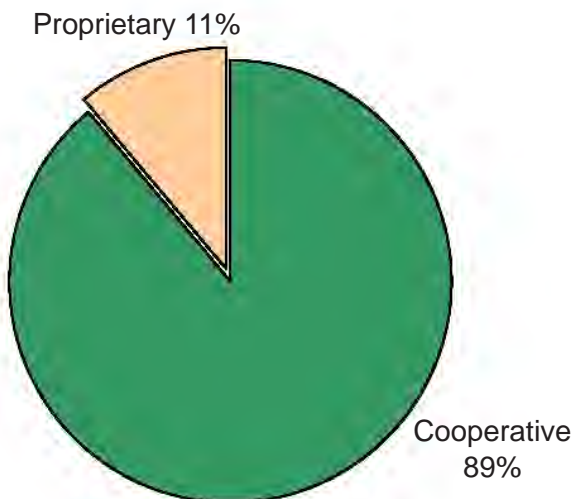
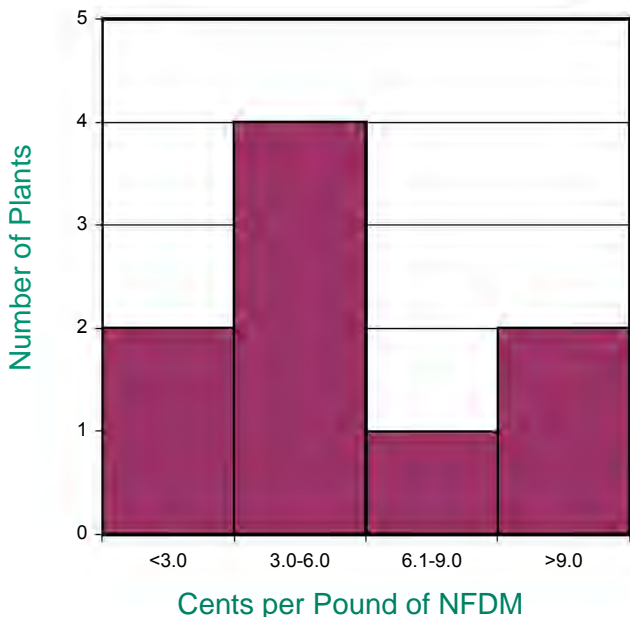


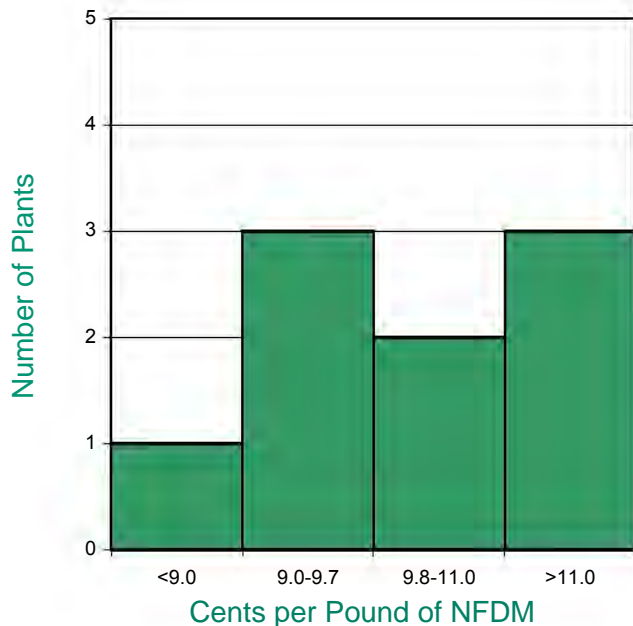
Figure 34. NFDM Processing Labor Cost per Pound



Average = 5.9¢ per pound
 Wt'd Average = 3.8¢ per pound
 Median = 4.2¢ per pound
 Average of low 3 = 3.2¢ per pound
 Average of high 3 = 7.9¢ per pound

- Four out of nine plants had labor costs under 4¢ per pound.
- The average labor cost per pound for the 3 highest cost plants was 146% higher than the average labor cost of 3.2¢ per pound for the 3 low cost plants.

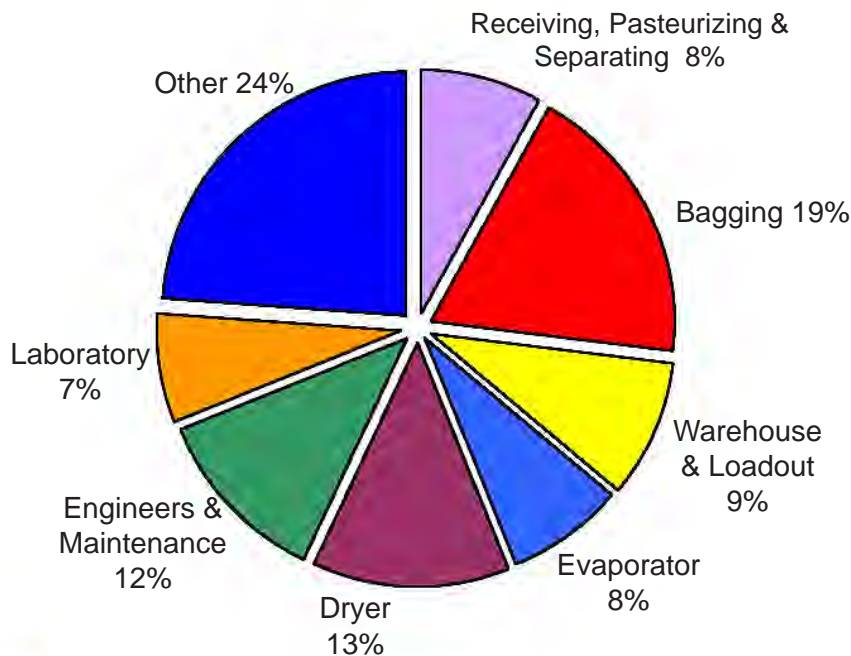
Figure 35. NFDM Processing Non-Labor Cost per Pound



Average = 12.6¢ per pound
 Wt'd Average = 9.6¢ per pound
 Median = 10.0¢ per pound
 Average of low 3 = 9.0¢ per pound
 Average of high 3 = 12.8¢ per pound

- The variation in processing non-labor costs was great, ranging from 8.2¢ to 31.6¢ per pound.
- The plants with the highest overall costs had processing non-labor costs 42% higher than that of the lowest cost plants.

Figure 36. Nonfat Dry Milk Labor Breakdown by Category

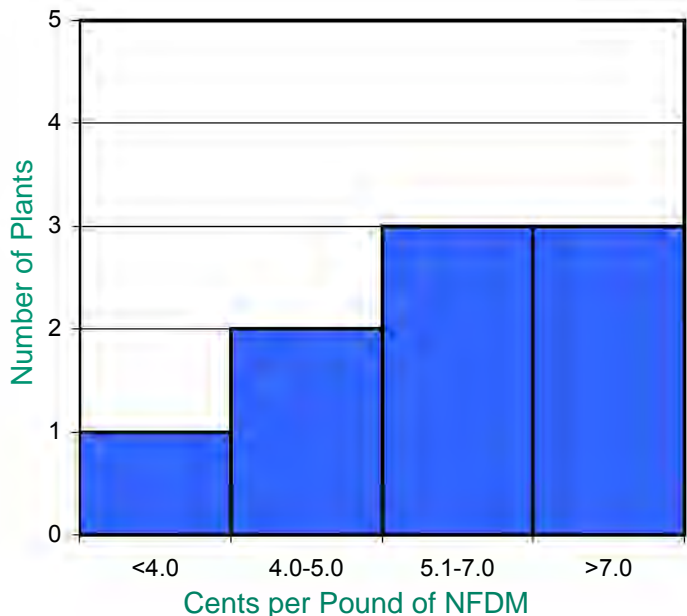


Based on detailed data:
 Labor cost averaged 5.9¢ per pound
 Labor cost averaged \$3.27 per 25 kg bag

Note: "Other" includes plant manager/superintendent, general plant, plant clerical, and field men.

Figure 37. Utility Cost per Pound

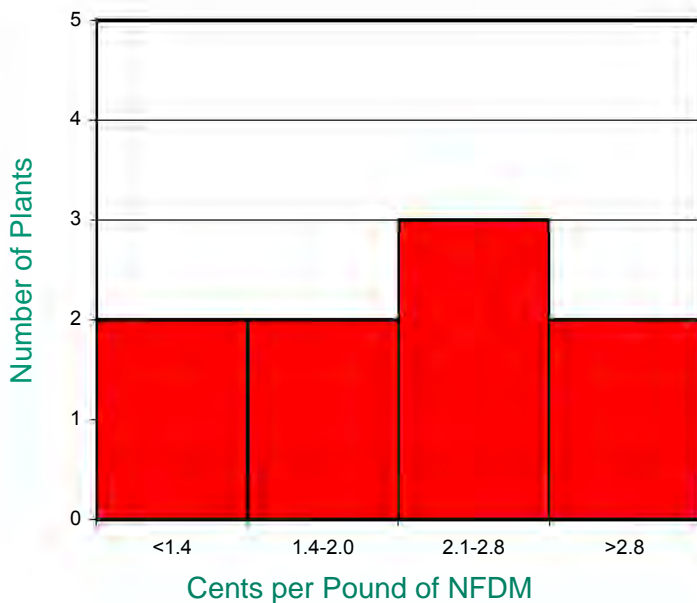
Includes cost of natural gas, fuel oil, electricity and sewage



Average	=	6.8¢ per pound
Wt'd Average	=	5.0¢ per pound
Median	=	5.5¢ per pound
Average of low 3	=	4.5¢ per pound
Average of high 3	=	9.9¢ per pound

- The operation of the dryer added significantly to the utility cost of the powder plants. Natural gas costs ranged from 41% to 77% of the total cost of utilities.
- Most of the plants had utility costs between 4¢ and 8¢ per pound.

Figure 38. Repairs, Maintenance, and Supplies Cost per Pound



Average	=	2.4¢ per pound
Wt'd Average	=	2.0¢ per pound
Median	=	2.2¢ per pound
Average of low 3	=	2.0¢ per pound
Average of high 3	=	3.3¢ per pound

- Three plants had repairs and maintenance costs less than 2.0¢ per pound.
- On average, cost of plant supplies exceeded repairs and maintenance costs by 65%.

Figure 39. Weighted Average Breakdown of Dollars Spent per Year on Natural Gas and Electricity in NFDM Plants

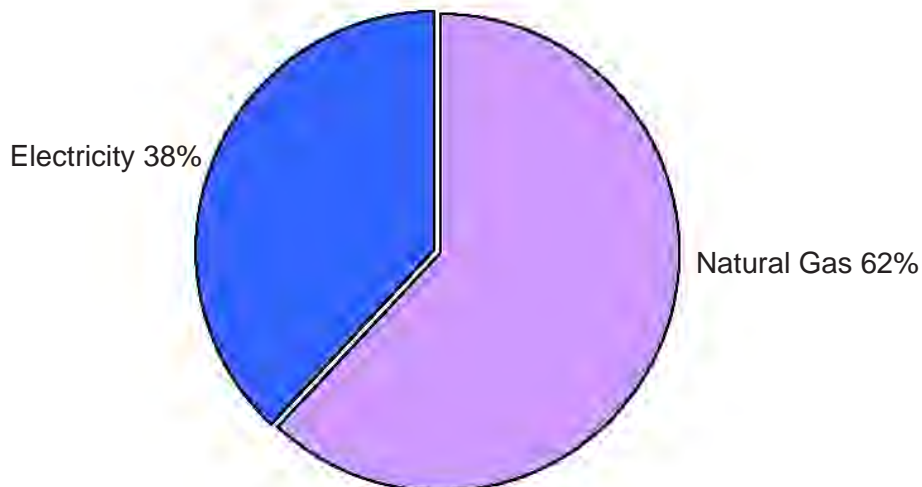


Figure 40: Comparison of Payroll Breakdown for Plant Employees and Salaried Employees

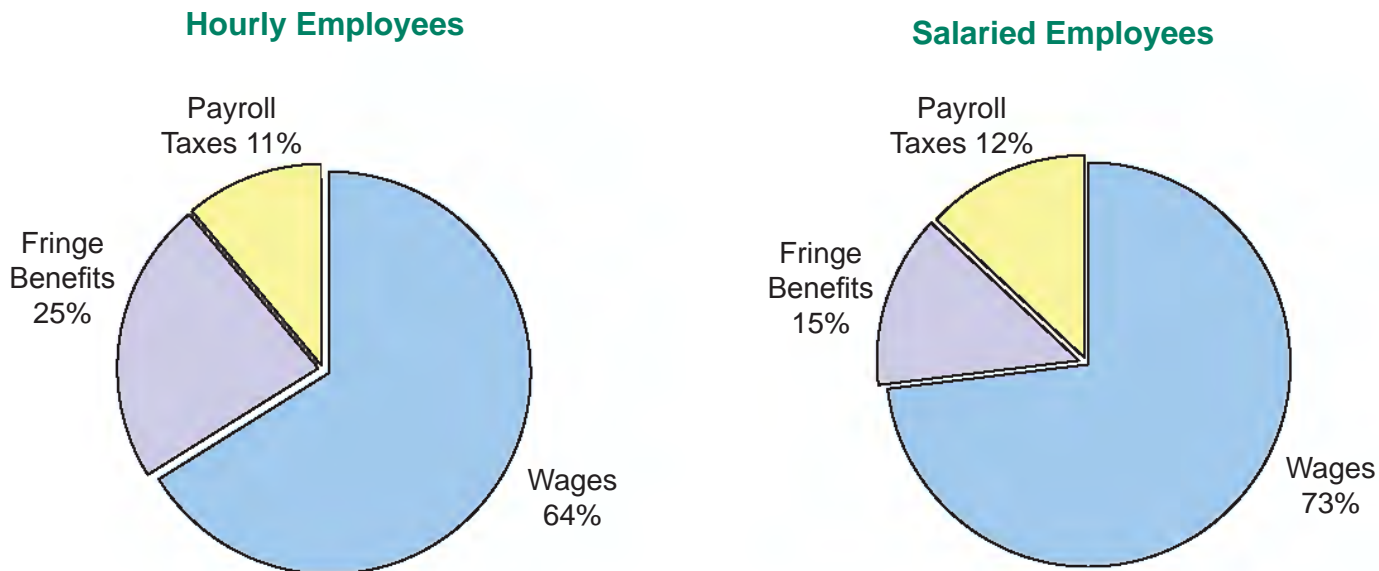
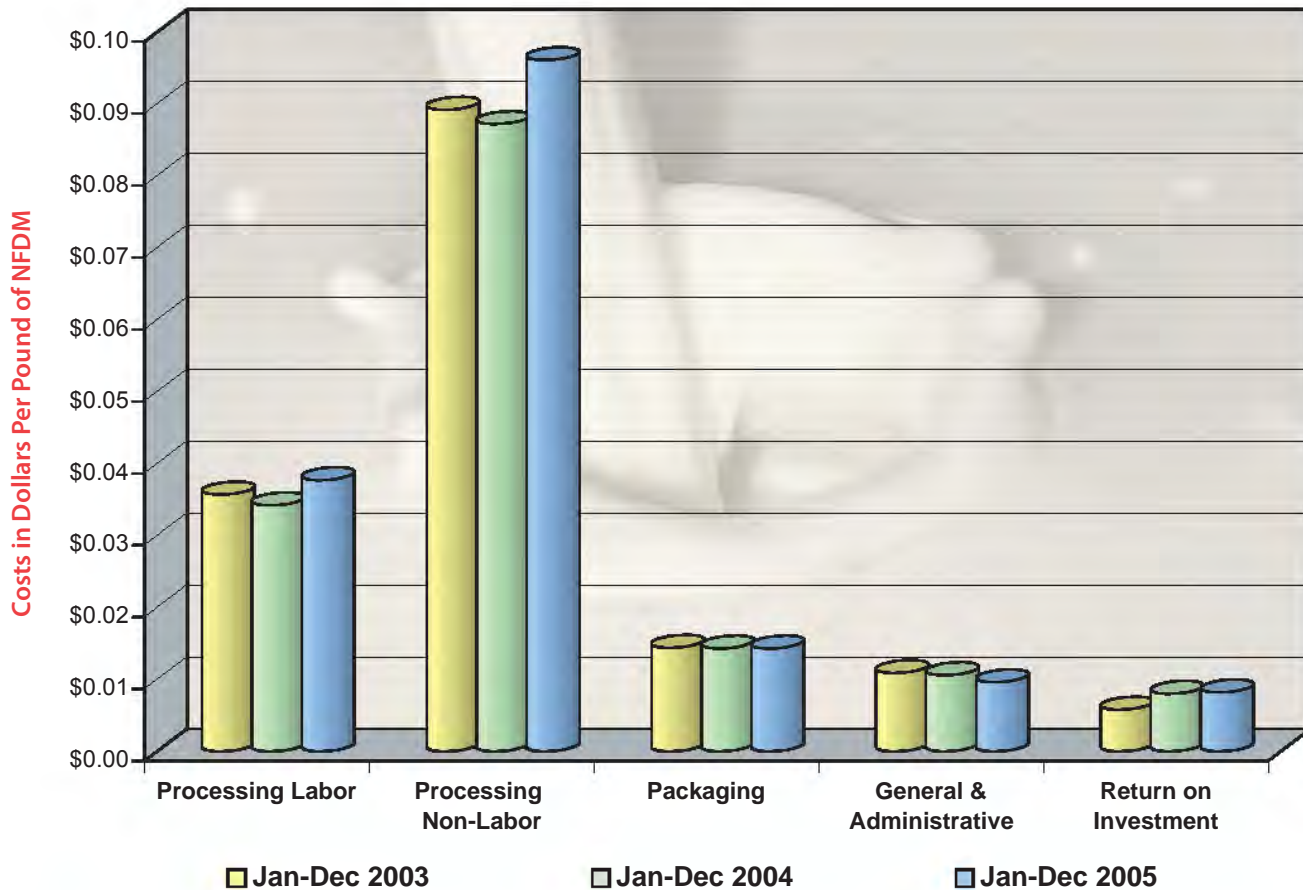
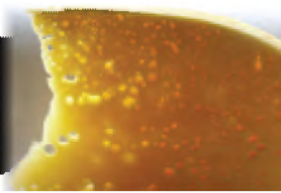


Figure 41. NFDM Processing Cost Comparison, 2003, 2004, 2005





Skim Whey Powder Study



Manufacturing cost data was collected and summarized from three California skim whey powder plants. The three plants processed 97.9 million pounds of the skim whey powder included in the study and represents 82 percent of the total skim whey powder processed in the state of California in 2005. Plant cost summary statistics based on the study plants give an indication of plant size and per pound processing costs for various categories (Table 5).

- As with nonfat dry milk powder, the combined utilities usage costs of producing skim whey powder exceeds that of any other single cost, including labor.
- The average total utilities cost was 6.7¢ per pound, which works out to be 22 percent higher than the cost of processing labor: 5.5¢ per pound.
- The category of utilities costs includes natural gas, electricity, and water/sewage expense.
- The plant(s) that incurred the lowest costs in the study produced the largest percentage of skim whey powder.
- Packaging costs based on container sizes of 25 kg and 50 lb bags were on average 1.3¢ per pound.
- The return on investment (ROI) allowance is calculated by subtracting accumulated depreciation from the original cost of fixed assets. The remaining book value is multiplied by the Moody's "BAA" corporate bond index. The amounts are then allocated to the products in the plant based on the same methods used to allocate the depreciation expense.

Throughout this section, charts are used to present the impact of individual cost categories upon production or to display distribution.

Table 5. Processing Costs for Three California Skim Whey Powder Plants**SKIM WHEY POWDER MANUFACTURING COSTS**

CURRENT Study Period: January through December 2005
 With Comparison to the same time period PRIOR YEAR (2004)

- Manufacturing cost data were collected and summarized from three California skim whey powder plants. The three plants processed 97.9 million pounds of skim whey powder during the 12-month study period, January through December 2005, representing 82% of the skim whey powder processed in California.
- The volume total includes skim whey powder packaged in container sizes of 25 kg and 50 lb. bags.
- To obtain the weighted average, individual plant costs were weighted by their skim whey powder processing volume relative to the total volume of skim whey powder processed by all plants included in the cost study.
- For this study period, one of the three plants processed skim whey powder at costs lower than the current manufacturing cost allowance for skim whey powder of \$0.267 per pound.

Breakdown of Skim Whey Powder Manufacturing Costs - January through December 2005

Categories	Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan- Dec 2005	PRIOR YEAR Weighted Average Cost All Plants Jan- Dec 2004	Actual Difference Current Less Prior Year
		Minimum	Maximum			
<i>Dollars Per Pound of Skim Whey Powder</i>						
Number of Plants	3	3	3	3	3	--
Processing Labor	\$0.0562	\$0.0437	\$0.0604	\$0.0562	\$0.0635	-\$0.0073
Processing Non-Labor	\$0.1735	\$0.1519	\$0.2081	\$0.1735	\$0.1488	\$0.0247
Packaging	\$0.0132	\$0.0103	\$0.0166	\$0.0132	\$0.0126	\$0.0006
General & Administrative	\$0.0029	\$0.0018	\$0.0032	\$0.0029	\$0.0026	\$0.0003
Return on Investment	\$0.0393	\$0.0307	\$0.0492	\$0.0393	\$0.0398	-\$0.0005
Average Total Cost	\$0.2851	--	--	\$0.2851	\$0.2673	\$0.0178
Volume in Group (Lbs.)	97,953,043	--	--	97,953,043	93,271,893	--
% Volume by Group	100.0%	--	--	100.0%	100.0%	--

Processing Labor: All labor costs associated with processing of product.

Processing Non-Labor: Includes costs such as utilities, repairs and maintenance, laundry, supplies, depreciation, plant insurance, and rent.

Packaging: Includes all non-reusable items used in the packaging of the product, such as boxes, bags, cartons, liners, tape, glue and stretch wrap.

General & Administrative: Includes expenses in the management of the company, such as: office supplies, short-term interest, dues and subscriptions, accounting fees, headquarter charges, office clerical wages and executive salaries.

Return on Investment: Calculated by subtracting accumulated depreciation from the original cost of assets, with the remaining book value multiplied by Moody's "BAA" corporate bond index.

Figure 42. Breakdown of Skim Whey Powder Processing Costs

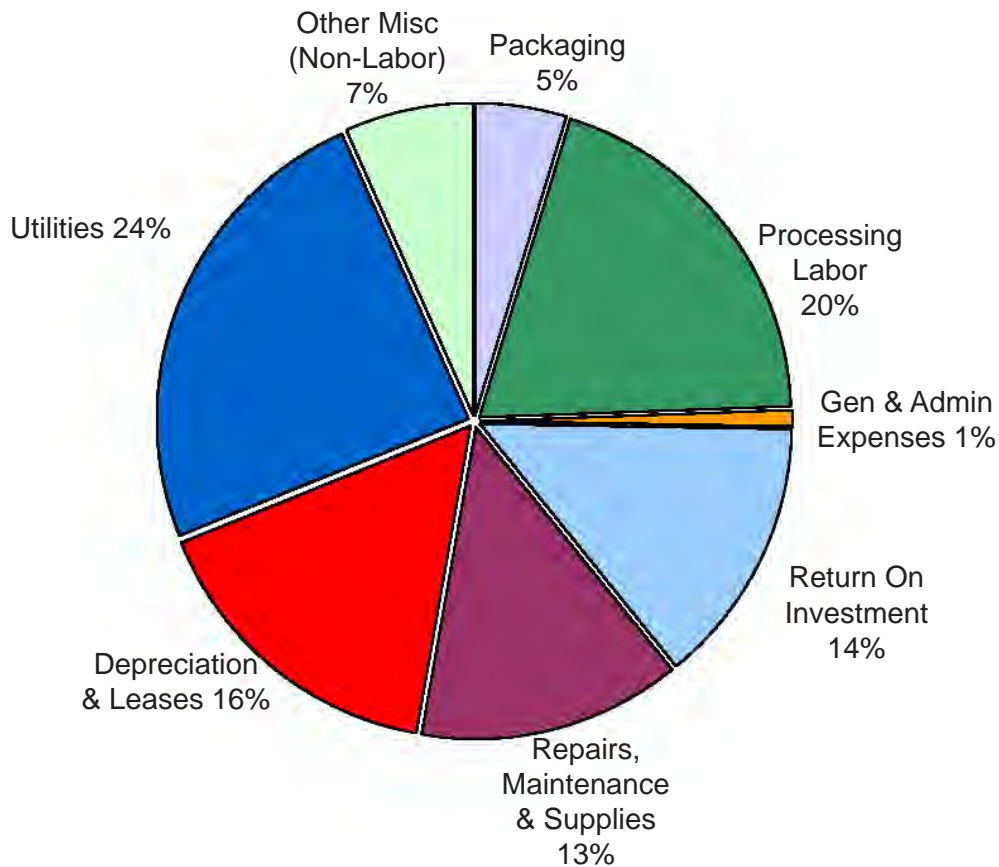


Figure 43. Weighted Average Breakdown of Dollars Spent per Year on Natural Gas and Electricity in Skim Whey Powder Plants

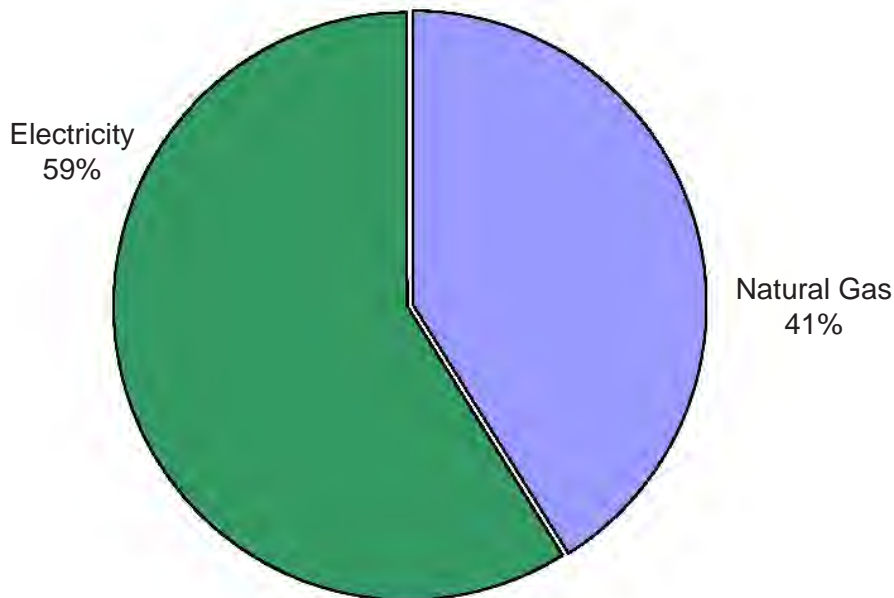


Figure 44. Share of California Skim Whey Powder Production by Ownership Type and by Workforce Type

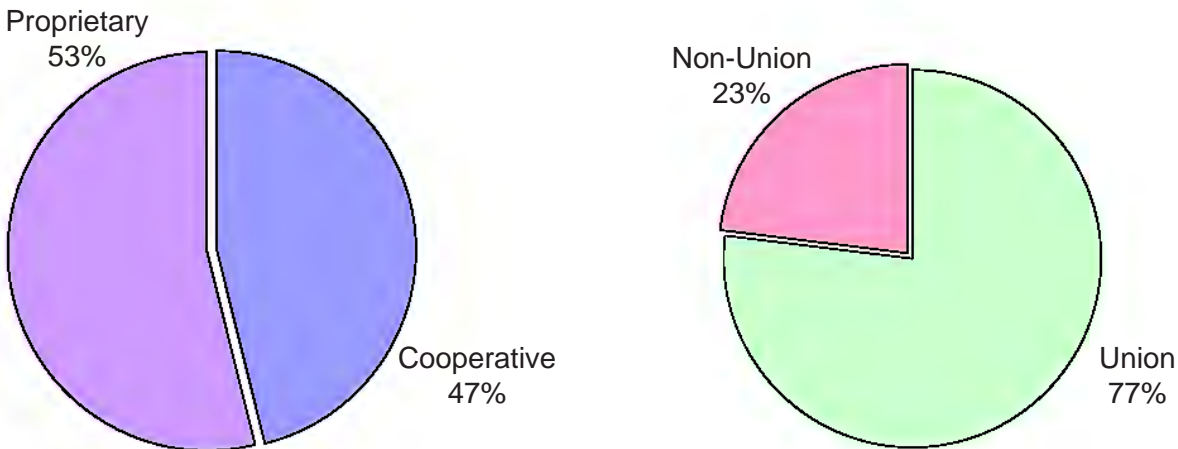
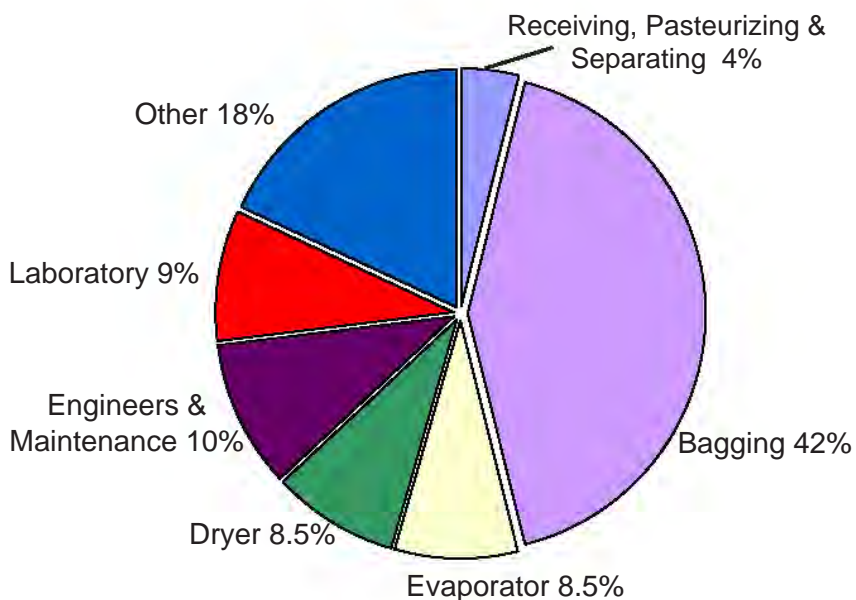


Figure 45. Skim Whey Powder Labor Breakdown by Category

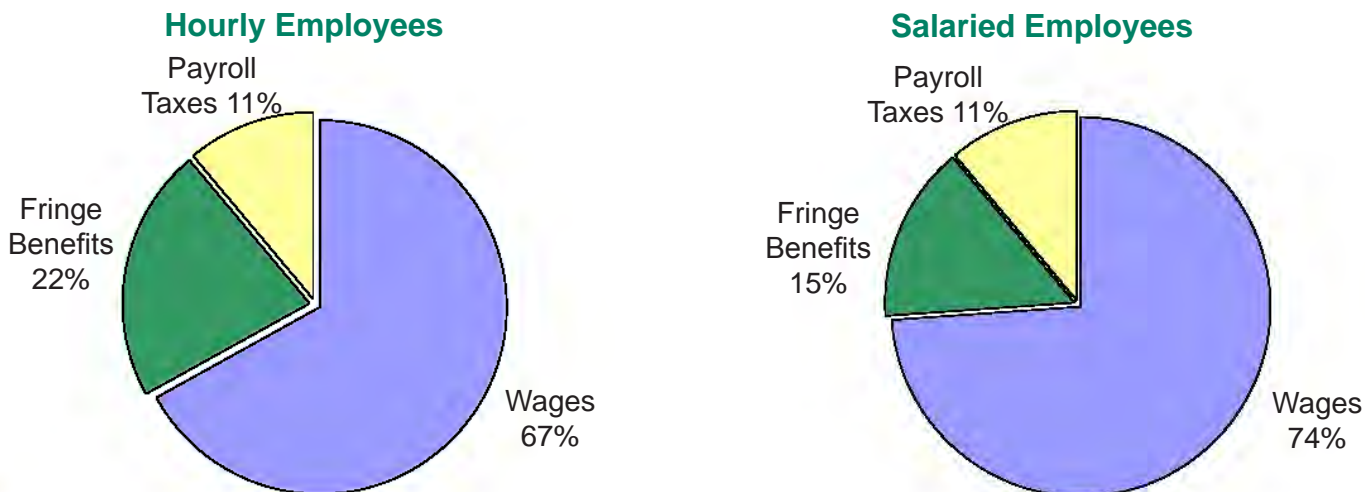


Based on detailed data:

Labor cost averaged 5.5¢ per pound
 Labor cost averaged \$2.86 per 25 kg bag
 Labor cost averaged \$2.66 per 20 kg bag

Note: "Other" includes plant manager/ superintendent, general plant, plant clerical, and field men.

Figure 46: Comparison of Payroll Breakdown for Plant Employees and Salaried Employees



Condensed Skim and Cream Study

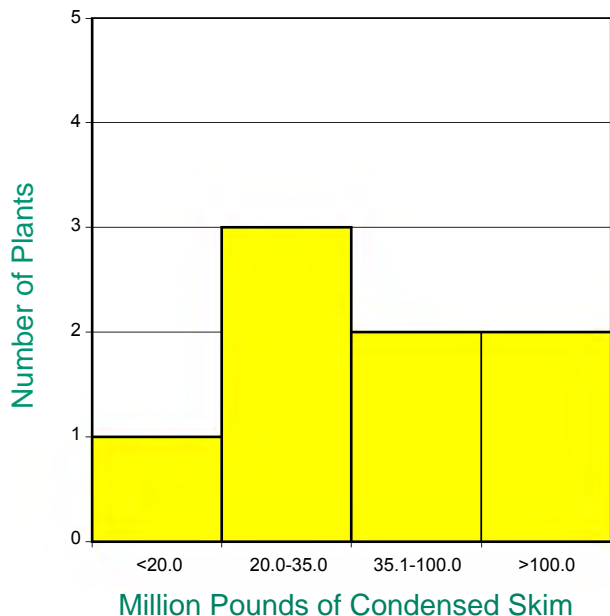
Most of the costs allocated to cream, condensed skim and other bulk dairy products come from general labor and general non-labor plant expenses. There are very little, if any, direct plant expenses allocated to these bulk fluid products. Because of the nature of allocating general plant expenses, the costs per pound of condensed skim and cream are not as precise compared to the costs per pound on packaged products such as butter, powder and cheese whose plant costs are largely composed of direct expenses.

Condensed Skim Overview

Cost studies were completed on eight condensed skim plants for 2005. In order not to reveal individual plant information, only non specific information is included in this section.

- Plants processed an average of 47 million pounds of condensed skim per year. Three of the eight plants processed less than 25 million pounds per year, and two plants processed over 100 million pounds per year. In addition to this, some plants produced in part or whole their own condensed skim and cream, while others purchased the same.

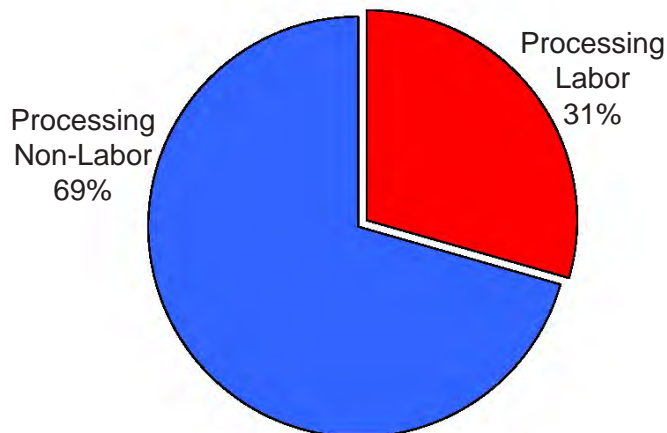
Figure 47. Annual Condensed Skim Production



Average	=	47 million pounds
Median	=	35 million pounds
Average of low 3	=	181 million pounds
Average of high 3	=	163 million pounds

- Condensed skim processing was on average, 47 million pounds for the year. Five of the plants produced between 20 and 100 million pounds.
- The condensed skim production of the 3 largest producing plants was 4.6 times more than that of the three smallest plants.

Figure 48. Comparison of Processing Costs for Condensed Skim



Processing non-labor includes utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance

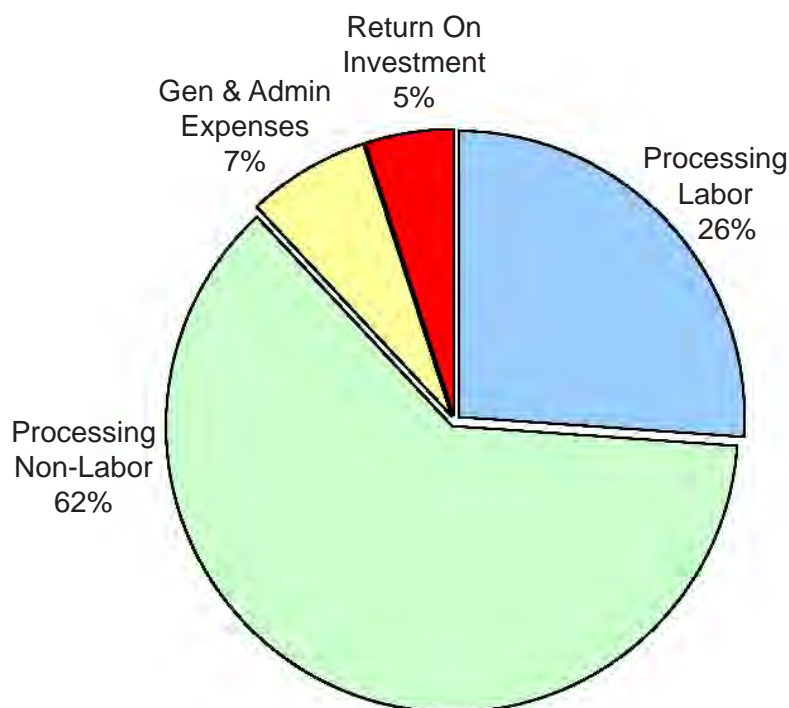
Low ratio = 13% Labor
87% Non-Labor

High ratio = 45% Labor
55% Non-Labor

- Non-labor processing costs include the plant expenses of utilities, depreciation, repairs and maintenance, and laundry.

- Due in part to some of the plants producing their own condensed skim and cream, there was quite a difference between processing cost per pound and volume processed. Some of the plants with the most condensed skim processed had among the highest costs. Similarly, some of the plants with the least condensed skim processed had the lowest costs.
- In general, processing non-labor costs included several different plant expenses, such as utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance. Processing non-labor costs showed little variation, ranging from 1.46¢ per pound to 3.09¢ per pound.

Figure 49. Breakdown of Condensed Skim Processing Costs

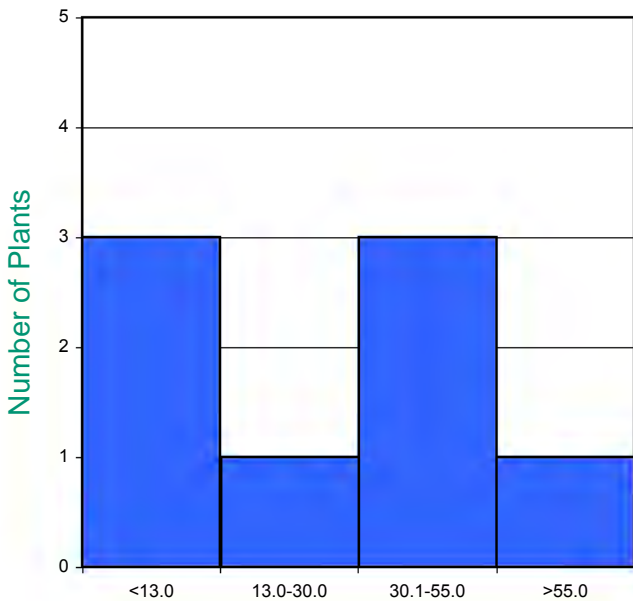


Cream Overview

Cost studies were completed on nine cream plants for 2005. Again, in order not to reveal individual plant information, only non-specific information is included in this section.

- Plants processed an average of 28 million pounds of cream per year. Much like condensed skim processing, the range of cream processing volumes was great.
- In general, average processing non-labor costs as a category were about twice that of labor costs. Included in non-labor costs are several different plant expenses, such as utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance.

Figure 50. Annual Cream Production

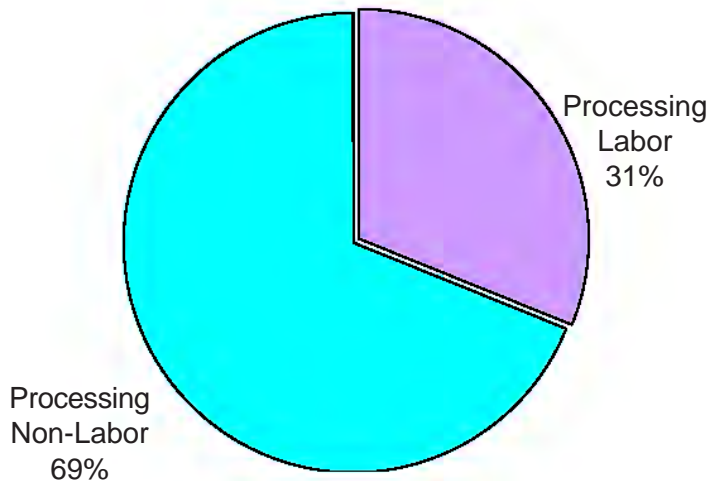


Million Pounds of Cream

Average	=	28 million pounds
Median	=	32 million pounds
Average of low 3	=	118 million pounds
Average of high 3	=	9 million pounds

- Cream production volume varied with the 3 smallest producers averaging 3 million pounds and the 3 largest producing on average over 61 million pounds of cream each.

Figure 51. Comparison of Processing Costs for Cream

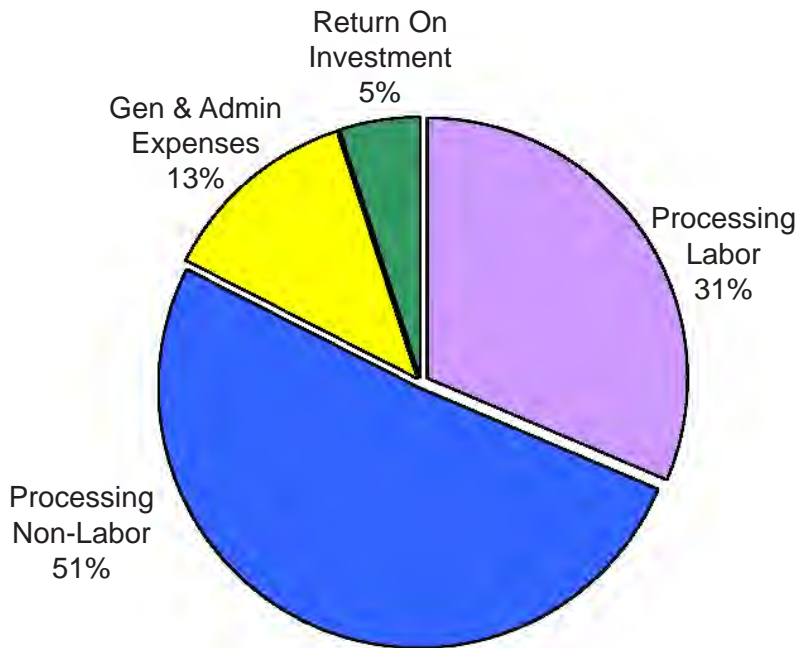


Processing non-labor includes utilities, depreciation, repairs and maintenance, laundry, supplies, and plant insurance

Low ratio = 17% Labor
83% Non-Labor

High ratio = 59% Labor
41% Non-Labor

Figure 52. Breakdown of Cream Processing Costs





Manufacturing Cost Unit
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