

# *Manufacturing Cost Annual*

**California 2009 Data**





CALIFORNIA  
**Manufacturing  
Cost Annual**

*2009 Data, Compiled and Published in 2011*

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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.*

*We welcome your comments on this Manufacturing Cost Annual.  
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# Table of Contents

Introduction.....	4
Manufacturing Cost Overview .....	5
Butter Study.....	6
Butter Manufacturing Costs.....	8
Nonfat Dry Milk Study.....	10
Nonfat Dry Milk Manufacturing Costs.....	12
Cheese Study.....	14
Cheese Manufacturing Costs.....	16
Condensed Skim and Cream Overview .....	18
Condensed Skim Overview.....	18
Cream Overview .....	19

## List of Tables

Table 1. All Cheddar Cheese Production Parameters .....	14
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## List of Figures

Figure 1. Manufacturing Costs by Category .....	5
Figure 2. Butter Packaging Size .....	6
Figure 3. Butter Production 2005 to 2009.....	6
Figure 4. Butter Manufacturing Costs .....	7
Figure 5. Butter Manufacturing Cost Allowance and Production .....	7
Figure 6. Butter Processing Labor .....	8
Figure 7. Butter Processing Non-Labor .....	8
Figure 8. Butter Manufacturing Costs 2007 to 2009.....	9
Figure 9. NFDM Packaging Size .....	10
Figure 10. NFDM Production 2005 to 2009.....	10
Figure 11. Nonfat Dry Milk Manufacturing Costs .....	11
Figure 12. NFDM Manufacturing Cost Allowance and Production.....	11
Figure 13. NFDM Processing Labor .....	12
Figure 14. NFDM Processing Non-Labor.....	12
Figure 15. NFDM Manufacturing Costs 2007 to 2009 .....	13
Figure 16. Cheese Production 2005 to 2009 .....	14
Figure 17. Cheese Manufacturing Costs .....	15
Figure 18. Cheese Manufacturing Cost Allowance and Production.....	15
Figure 19. Cheese Processing Labor .....	16
Figure 20. Cheese Processing Non-Labor.....	16
Figure 21. Cheese Manufacturing Costs 2007 to 2009 .....	17
Figure 22. Condensed Skim Sales 2007 to 2009 .....	18
Figure 23. Condensed Skim Manufacturing Costs 2008 to 2009 .....	18
Figure 24. Cream Sales 2007 to 2009.....	19
Figure 25. Cream Manufacturing Costs 2008 to 2009.....	19
Figure 26. Simplified Flowchart of a Butter and Nonfat Dry Milk Plant.....	20
Figure 27. Simplified Flowchart of a Cheese Plant with By-Product Processing.....	20

# Introduction

The California Food and Agricultural Code specifies that the California Department of Food and Agriculture (CDFA) must consider manufacturing costs in determining appropriate minimum prices for products categorized as Class 4a (butter and dried milk products) and Class 4b (cheese). To comply with the legislative decree, CDFA 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.

CDFA maintains a Manufacturing Cost Unit that consists of professional auditors specializing in dairy accounting practices. The auditors work with plant management to gather data on all aspects of the operation, review plant records on-site, and allocate plant expenditures to each product manufactured by the plant. The studies are conducted and developed in conformity with generally accepted accounting principles, cost accounting techniques, and instructions contained in the Dairy Marketing Branch's Audit and Cost Procedures Manual.

Any plant that produces Class 4a and/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), and Cheddar cheese production. The 2009 California Manufacturing Cost Annual includes data obtained from eight butter plants, nine NFDM plants, and six Cheddar cheese plants. Data on condensed skim and cream is collected concurrently from plants that participate. Plants that manufacture condensed skim and cream but do not manufacture butter, NFDM, or Cheddar cheese are not included in the study. As a result, data on condensed skim and cream is based on a much lower percentage of annual production in California.

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, and Cheddar cheese plants over several years. 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 CDFA has the legal authority to collect cost information from the various types of milk processors, the majority of plants have found the information contained in the studies valuable and have cooperated voluntarily.



# Introduction

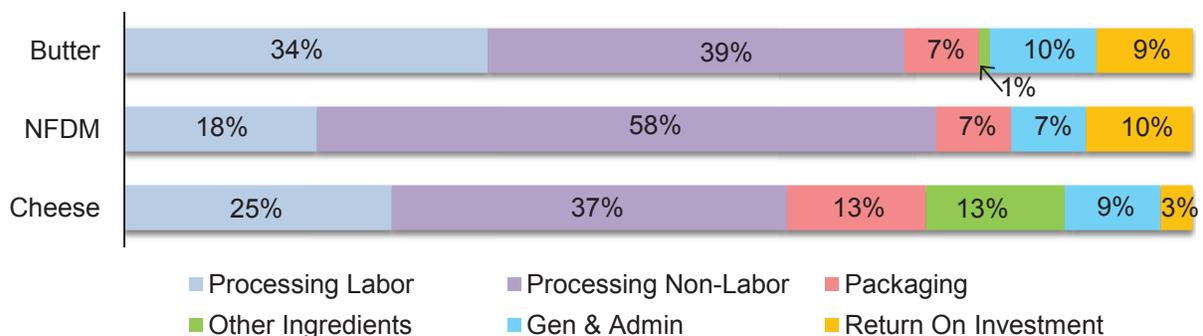
## Manufacturing Cost Overview

The weighted average manufacturing cost of a product includes six categories described below. To obtain a weighted average cost, an individual plant's cost is weighted by the plant's production volume relative to the total volume of all the plants included in the study.

- Processing labor costs are plant wages, plant salaries, payroll taxes, and fringe benefits associated with the processing of a product.
- Processing non-labor includes costs such as, utilities, repairs, maintenance, supplies, depreciation, plant insurance, outside storage, and rental expenses.
- Packaging costs include all non-reusable items used in the packaging of a product, such as boxes, bags, tape, glue, and stretch wrap.
- Other ingredient costs may include salt, color, rennet, etc.
- General and administrative costs include expenses incurred in the management of a company, for example, office supplies, short-term interest, dues and subscriptions, accounting fees, headquarter expenses, office clerical wages, and executive salaries.
- Return on investment (ROI) allowance is an opportunity cost that 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 its capital elsewhere. ROI costs are calculated by subtracting accumulated depreciation from the original cost of assets, and then multiplying the remaining book value by the Moody's BAA corporate bond index.

The chart below displays the breakdown of manufacturing cost for each product by category (Figure 1).

**Figure 1. Manufacturing Costs by Category**



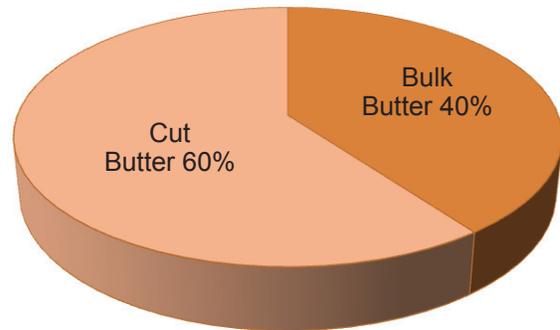
# Butter Study

The butter study included eight butter plants. The eight plants processed 512.5 million pounds of butter during the period January 2009 through December 2009, representing 98.5 percent of the butter processed in California. Production included both bulk and cut butter; however, to determine packaging costs, only 25-kg. bulk butter packaging materials were considered.

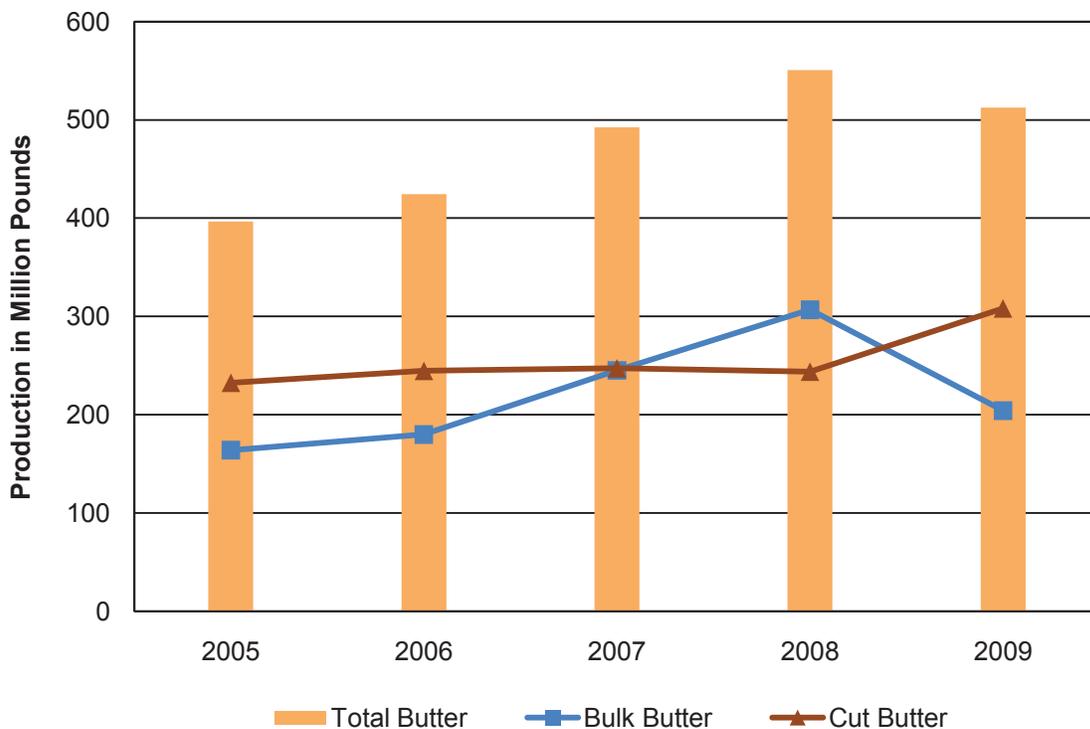
The total butter production for this study fell about 38 million pounds since 2008. Of the total butter processed, bulk butter accounted for 40 percent and cut butter made up the remaining 60 percent (Figure 2). In 2009, the participating processors decreased their bulk butter production to 204.2 million pounds yet increased their cut butter production to 308.3 million pounds. Figure 3 shows how bulk, cut, and total butter volumes have changed over the years.

To avoid revealing plant specific information, each plant was assigned to either a low or high cost group based on its total manufacturing cost.

**Figure 2. Butter Packaging Size**



**Figure 3. Butter Production 2005 to 2009**



**Figure 4. Butter Manufacturing Costs**

**BUTTER MANUFACTURING COSTS**

CURRENT Study Period: January through December 2009  
With Comparison to the same time period PRIOR YEAR (2008)

- Manufacturing cost data were collected and summarized from eight California butter plants. The eight plants processed 512.5 million pounds of butter during the 12-month study period, January through December 2009, representing 98.5% 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 0% of the butter was processed at a cost less than the current manufacturing cost allowance for butter of \$0.1560 per pound.

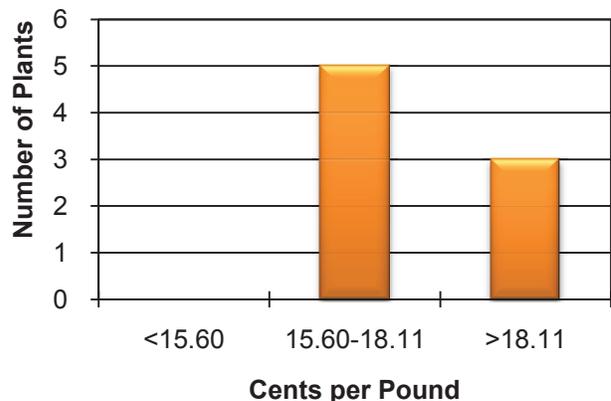
**Breakdown of Butter Manufacturing Costs - January through December 2009**

Categories	Low Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2009	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2008	Actual Difference Current Less Prior Year
			Minimum	Maximum			
<i>Dollars Per Pound of Butter</i>							
Number of Plants	4	4	8	8	8	8	0
Processing Labor	\$0.0604	\$0.0641	\$0.0459	\$0.1061	<b>\$0.0620</b>	\$0.0485	\$0.0135
Processing Non-Labor	\$0.0699	\$0.0742	\$0.0517	\$0.1609	<b>\$0.0718</b>	\$0.0656	\$0.0062
Packaging	\$0.0114	\$0.0137	\$0.0107	\$0.0160	<b>\$0.0124</b>	\$0.0136	-\$0.0012
Other Ingredients	\$0.0025	\$0.0022	\$0.0019	\$0.0031	<b>\$0.0024</b>	\$0.0023	\$0.0001
General & Administrative	\$0.0159	\$0.0210	\$0.0129	\$0.0480	<b>\$0.0182</b>	\$0.0167	\$0.0015
Return on Investment	\$0.0076	\$0.0227	\$0.0034	\$0.0633	<b>\$0.0143</b>	\$0.0086	\$0.0057
Average Total Cost	\$0.1677	\$0.1979	--	--	<b>\$0.1811</b>	\$0.1553	\$0.0258
Volume in Group (Lbs.)	283,885,140	228,658,965	--	--	<b>512,544,105</b>	550,697,392	-38,153,287
% Volume by Group	55.4%	44.6%	--	--	<b>100.0%</b>	100.0%	--

In 2009, each cost group included four plants. Figure 4 lists the weighted average cost per pound for each category of butter manufacturing cost.

No plant participating in the 2009 butter study had a manufacturing cost below the current cost allowance of \$0.1560 per pound (Figure 5).

**Figure 5. Butter Manufacturing Cost Allowance and Production**

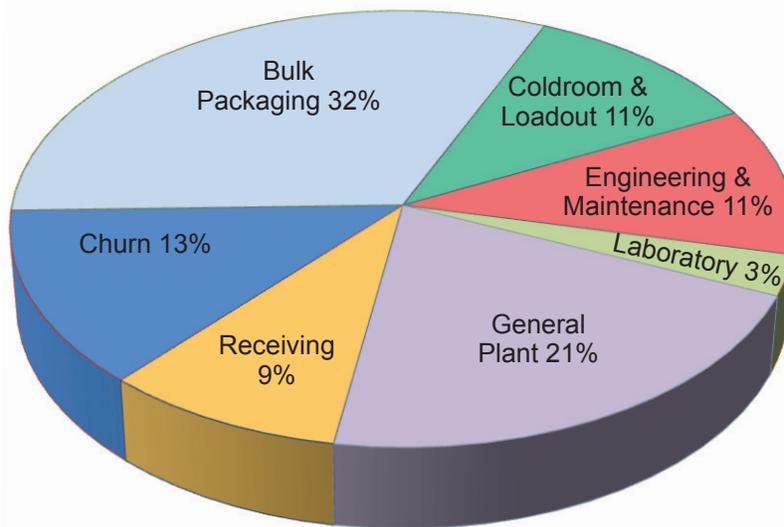


# Butter Study

## Butter Manufacturing Costs

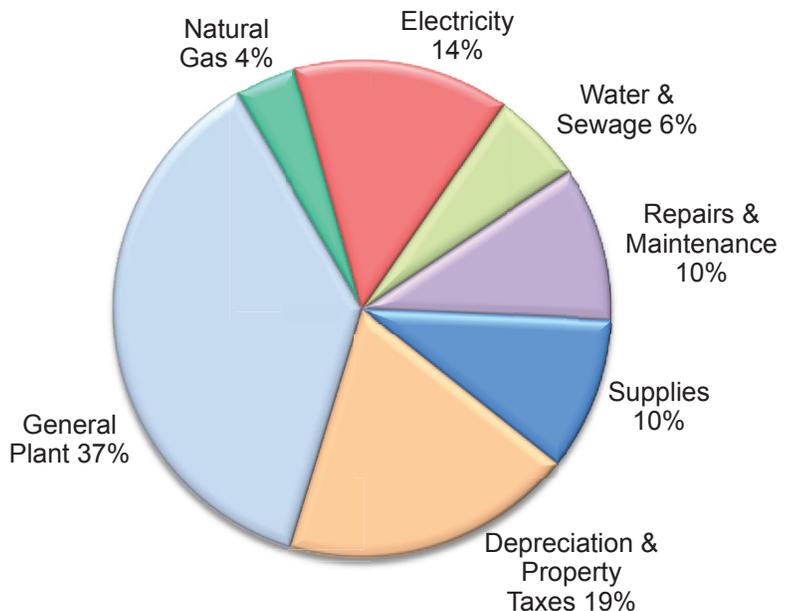
Processing labor costs were \$0.0620 per pound and represented 34 percent of the butter manufacturing cost. A further breakdown of processing labor costs revealed butter packaging was the largest category. The weighted average bulk butter packaging labor cost of \$0.0200 per pound accounted for 32 percent of total processing labor cost (Figure 6). General plant labor costs represented 21 percent and included plant supervision and various general plant labor expenses.

**Figure 6. Butter Processing Labor**



**Figure 7. Butter Processing Non-Labor**

Processing non-labor costs were \$0.0718 per pound and accounted for 39 percent of the manufacturing cost. General plant non-labor accounted for 37 percent of processing non-labor (Figure 7) and included costs such as, plant insurance, outside storage, and rental expense.



# Butter Study

The total volume of butter used to determine the weighted average cost included both bulk and cut butter. Only packaging costs for 25-kg. bulk butter were considered. The weighted average packaging cost was \$0.0124 per pound, a 9 percent decrease from 2008, and accounted for 7 percent of the manufacturing cost.

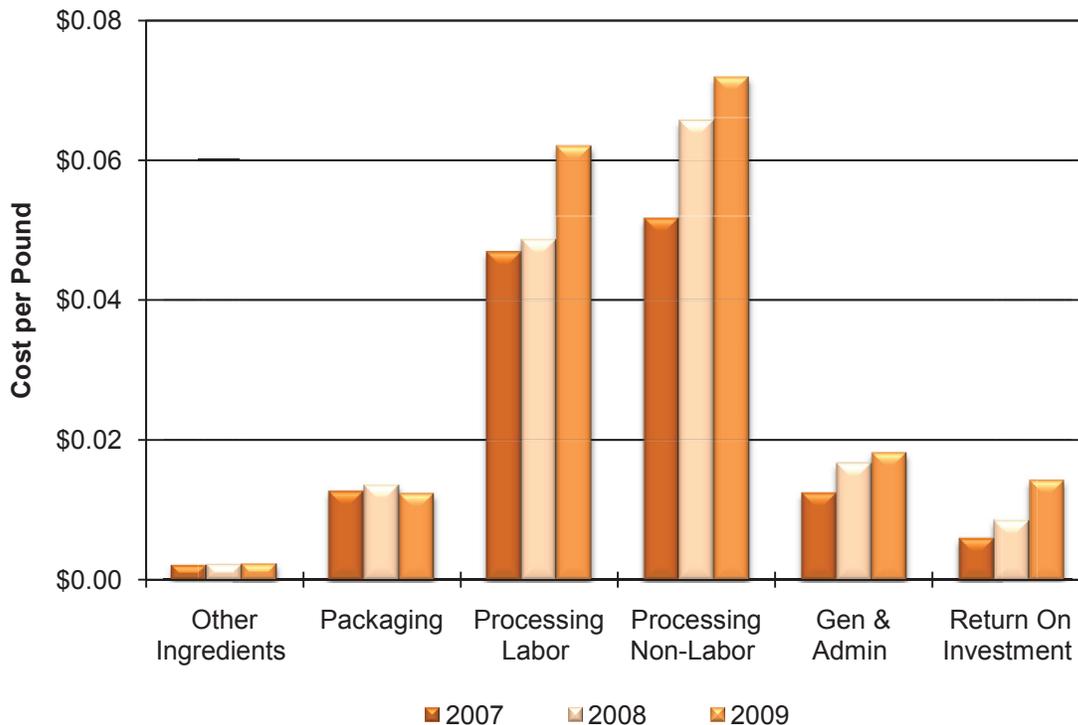
Other ingredient costs increased slightly in 2009. The weighted average cost was \$0.0024 per pound and represented 1 percent of the manufacturing cost.

General and administrative costs increased to \$0.0182 per pound and represented 10 percent of the manufacturing cost.

Return on investment costs rose to \$0.0143 per pound, a 66 percent increase over 2008, and accounted for 9 percent of the manufacturing cost.

The cost of manufacturing butter increased to \$0.1811 from \$0.1553 per pound the prior year. Figure 8 displays cost comparisons by category and the changes that occurred in each, over a three-year period.

**Figure 8. Butter Manufacturing Costs 2007 to 2009**



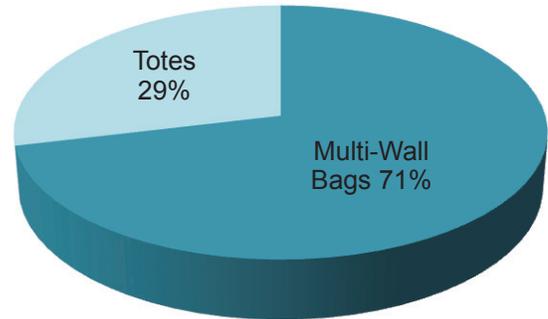
# Nonfat Dry Milk Study

The 2009 nonfat dry milk study included nine plants whose combined production was 815.1 million pounds, representing 97.6 percent of the NFDM produced in California. Of the 815.1 million pounds produced, 99.69 percent was sold for human consumption, and 0.31 percent was sold as animal feed.

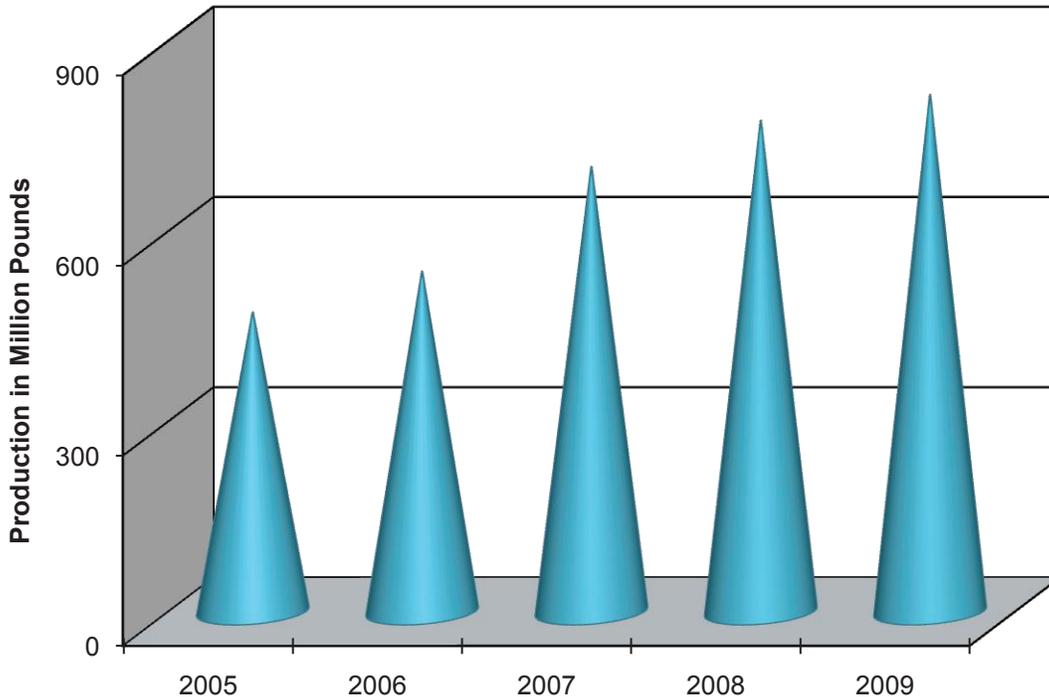
The total NFDM production for this study increased 5 percent over the prior year. Approximately 71 percent of the NFDM was packaged in 25-kg. or 50-lb. multi-wall bags, and 29 percent was packaged in totes weighing between 1,100 to 3,200-lbs. each (Figure 9). NFDM production has increased steadily since 2005, and Figure 10 displays changes over the last five years.

To avoid revealing plant specific information, each plant was assigned to either a low cost group, medium cost group, or high cost group based on its total manufacturing cost.

**Figure 9. NFDM Packaging Size**



**Figure 10. NFDM Production 2005 to 2009**



# Nonfat Dry Milk Study

**Figure 11. Nonfat Dry Milk Manufacturing Costs**

**NONFAT DRY MILK MANUFACTURING COSTS**  
 CURRENT Study Period: January through December 2009  
 With Comparison to the same time period PRIOR YEAR (2008)

- Manufacturing cost data were collected and summarized from nine California NFDM plants. The nine plants processed 815.1 million pounds of NFDM during the 12-month study period, January through December 2009, representing 97.6% of the NFDM processed in California.
- The 97.6% includes both animal and human consumption. Human consumption representing 99.69% of the 815.1 million pounds of NFDM processed, and animal representing 0.31%.
- The volume total includes all grades of NFDM packaged in any container size, but the costs reflect only costs for 25 kg and 50 lb. bags of NFDM.
- To obtain the weighted average, individual plant costs were weighted by their NFDM processing volume relative to the total volume of NFDM processed by all plants included in the cost study.
- For this study period, approximately 38.3% of the NFDM was processed at a cost less than the current manufacturing cost allowance for NFDM of \$0.1698 per pound.

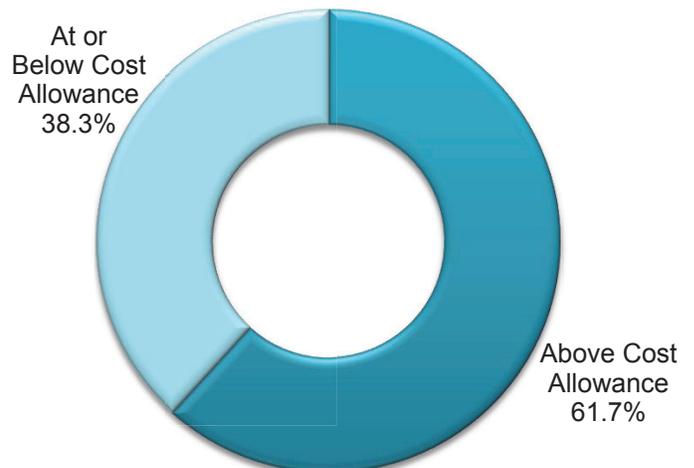
**Breakdown of Nonfat Dry Milk Manufacturing Costs - January through December 2009**

Categories	Low Cost Group	Medium Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2009	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2008	Actual Difference Current Less Prior Year
				Minimum	Maximum			
<i>Dollars Per Pound of NFDM</i>								
Number of Plants	3	3	3	9	9	9	9	0
Processing Labor	\$0.0335	\$0.0457	\$0.0323	\$0.0267	\$0.0977	\$0.0366	\$0.0340	\$0.0026
Processing Non-Labor	\$0.0997	\$0.1326	\$0.1338	\$0.0907	\$0.2028	\$0.1156	\$0.1175	-\$0.0019
Packaging	\$0.0144	\$0.0154	\$0.0138	\$0.0127	\$0.0162	\$0.0145	\$0.0147	-\$0.0002
General & Administrative	\$0.0088	\$0.0125	\$0.0272	\$0.0074	\$0.0280	\$0.0135	\$0.0128	\$0.0007
Return on Investment	\$0.0092	\$0.0200	\$0.0393	\$0.0050	\$0.0424	\$0.0182	\$0.0141	\$0.0041
Average Total Cost	\$0.1656	\$0.2262	\$0.2464	--	--	\$0.1984	\$0.1931	\$0.0053
Volume in Group (Lbs.)	427,738,608	222,649,688	164,760,147	--	--	815,148,443	774,458,542	40,689,901
% Volume by Group	52.5%	27.3%	20.2%	--	--	100.0%	100.0%	--

**Figure 12. NFDM Manufacturing Cost Allowance and Production**

In 2009, each cost group included three plants. Figure 11 lists the weighted average cost per pound for each category of NFDM manufacturing cost.

Approximately 38.3 percent of the total NFDM production in the study was processed at or below the current manufacturing cost allowance of \$0.1698 per pound (Figure 12).

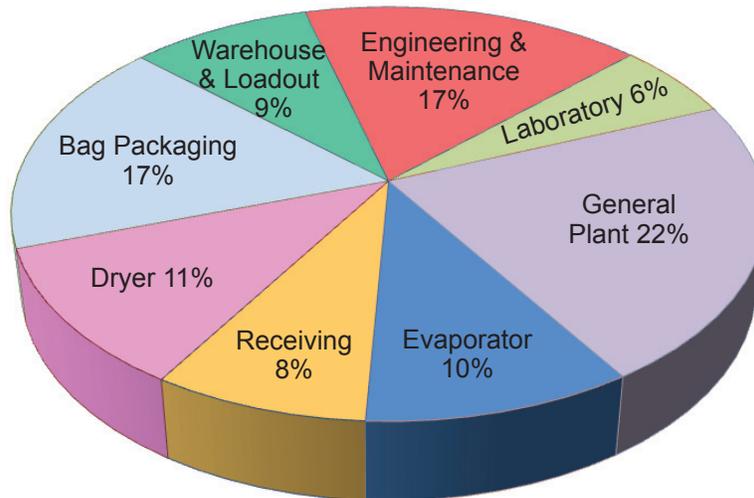


# Nonfat Dry Milk Study

## Nonfat Dry Milk Manufacturing Costs

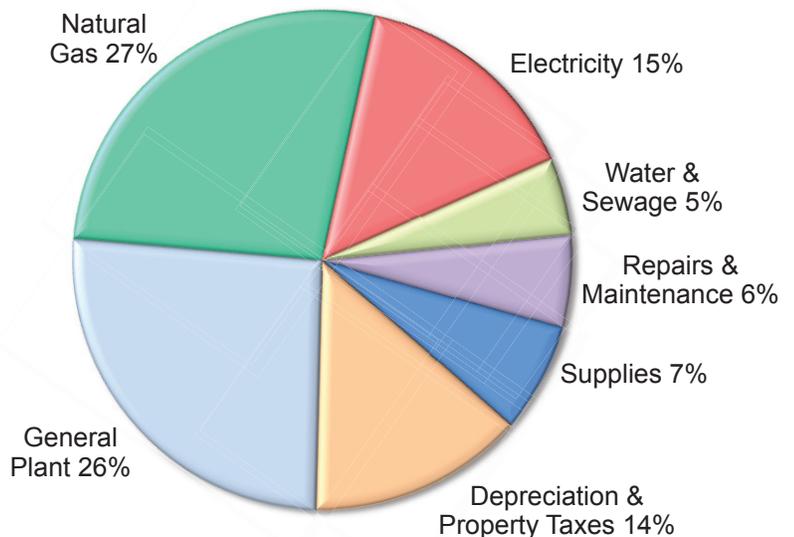
Processing labor costs were \$0.0366 per pound, 8 percent higher than in 2008. The weighted average packaging labor cost for a 25-kg. bag was \$0.0064 per pound, representing 17 percent of the total processing labor cost (Figure 13). General plant labor represented 22 percent of labor costs and included plant supervision and various general plant labor expenses.

**Figure 13. NFDM Processing Labor**



**Figure 14. NFDM Processing Non-Labor**

Processing non-labor costs were \$0.1156 per pound and accounted for 58 percent of the total manufacturing cost. General plant expenses accounted for 26 percent of the total processing non-labor category (Figure 14) and included costs such as, plant insurance, outside storage, and rental expense.



# Nonfat Dry Milk Study

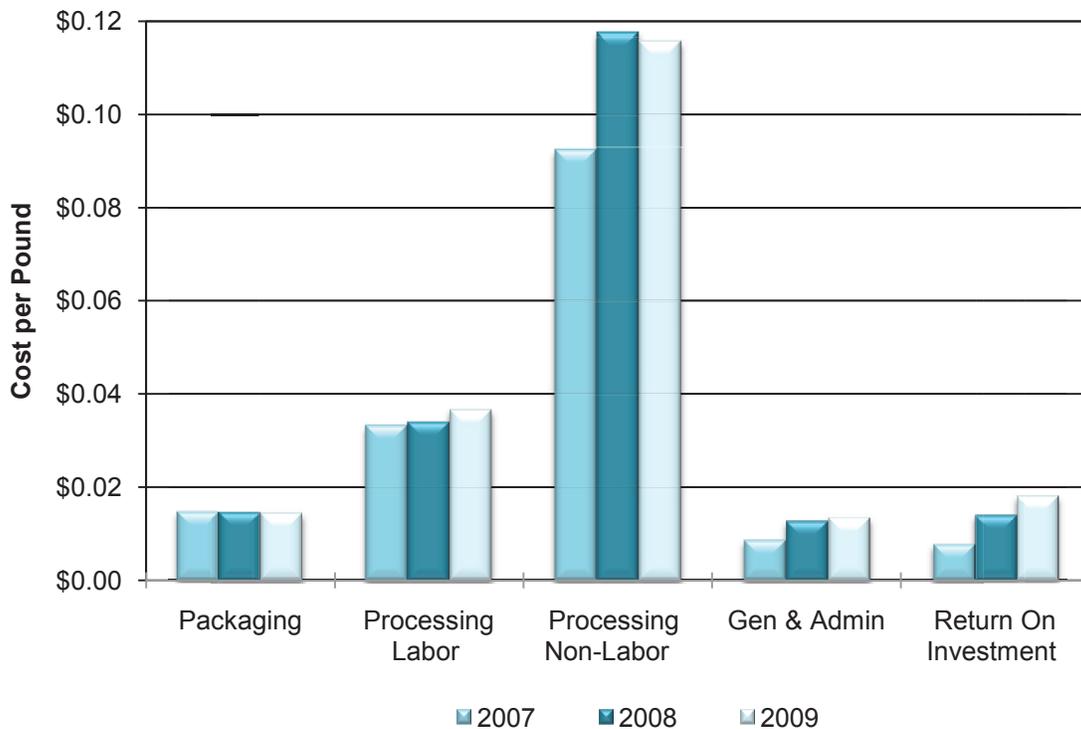
The weighted average packaging cost for a 25-kg. bag was \$0.0145 per pound and represented 7 percent of the total manufacturing cost.

General and administrative costs were \$0.0135 per pound and accounted for 7 percent of the manufacturing cost.

Return on investment costs rose to \$0.0182 per pound from \$0.0141 in 2008, a 29 percent increase.

The cost of manufacturing NFDM increased to \$0.1984 from \$0.1931 per pound the prior year. Figure 15 shows the changes that occurred in each category of cost over a three-year period.

**Figure 15. NFDM Manufacturing Costs 2007 to 2009**

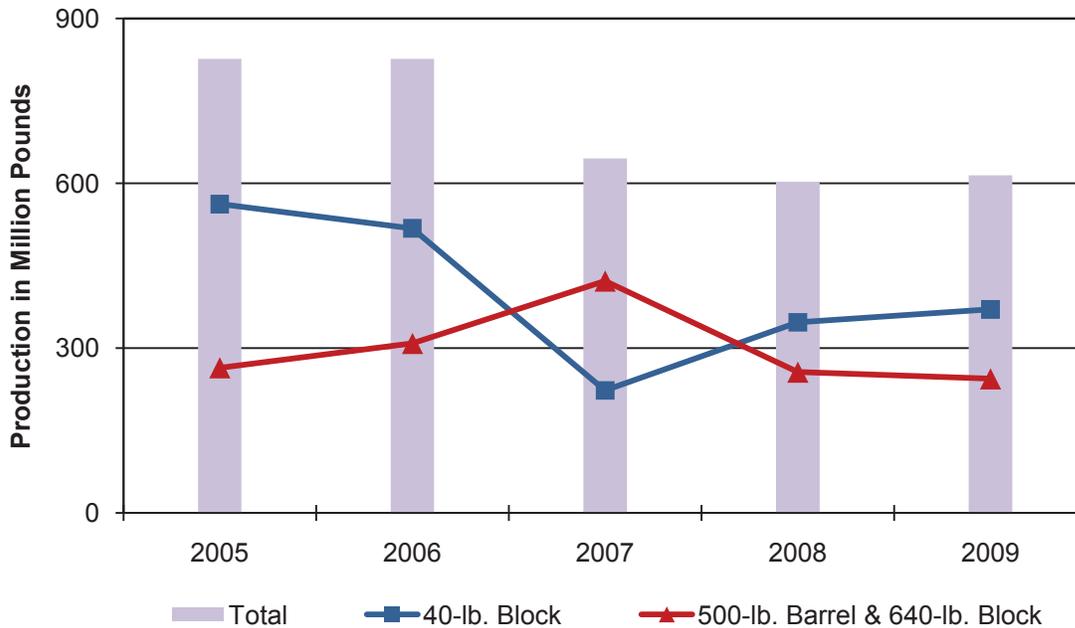


# Cheese Study

In 2009, the cheese study included six plants. The six plants processed 614.7 million pounds, representing 95.6 percent of the Cheddar and Jack cheese processed in California. In addition to Cheddar and Jack cheeses, the cheese plants processed various other types of cheese and cheese by-products.

The total Cheddar and Jack cheese production for this study increased 2 percent since 2008. Figure 16 displays production volume changes over the last five years.

**Figure 16. Cheese Production 2005 to 2009**



To avoid revealing plant specific information, each plant was assigned to either a low or high cost group based on its manufacturing cost. In 2009, each cost group included three plants. Figure 17, on the next page, lists the weighted average cost for each category of cheese manufacturing cost.

For all Cheddar cheese, the weighted average yield was 13.28 pounds of cheese per hundredweight (cwt.) of milk, the weighted average moisture was 38.03 percent, and the weighted average vat test was 4.62 percent fat and 9.58 percent solids-not-fat (Table 1).

**Table 1. All Cheddar Cheese Production Parameters**

Cost Group	Finished Moisture %	Vat Fat Test %	Vat SNF Test %	Vat Yield (Lbs.)
Low	38.23	4.79	9.67	13.87
High	37.30	4.01	9.25	11.12
Wt'd Avg.	38.03	4.62	9.58	13.28

# Cheese Study

**Figure 17. Cheese Manufacturing Costs**

**CHEESE MANUFACTURING COSTS**

CURRENT Study Period: January through December 2009  
With Comparison to the same time period PRIOR YEAR (2008)

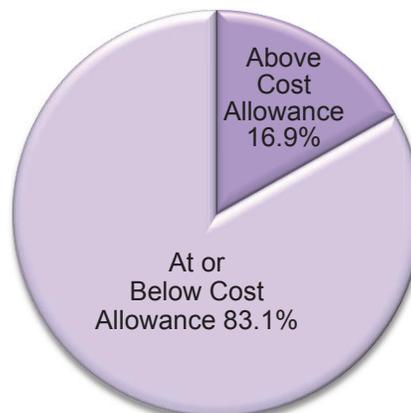
- Manufacturing cost data were collected and summarized from six California cheese plants. The six plants processed 614.7 million pounds of cheese during the 12-month study period, January through December 2009, representing 95.6% of the Cheddar and Monterey Jack Cheeses processing in California.
- The 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 13.28 lbs. of cheese per hundredweight of milk. The weighted average moisture was 38.03% and weighted average vat tests were 4.62% fat and 9.58% SNF.
  - For 40-lb. blocks: the weighted average yield was 13.93 lbs. of cheese per hundredweight of milk. The weighted average moisture was 38.30% and weighted average vat tests were 4.74% fat and 9.66% SNF.
- For this study period, approximately 83.1% of the cheese was processed at a cost less than the current manufacturing cost allowance for cheese of \$0.1988 per pound.

**Breakdown of Cheese Manufacturing Costs - January through December 2009**

Categories	Low Cost Group	High Cost Group	Range of Costs		CURRENT Weighted Average Cost All Plants Jan-Dec 2009	PRIOR YEAR Weighted Average Cost All Plants Jan-Dec 2008	Actual Difference Current Less Prior Year
			Minimum	Maximum			
<i>Dollars Per Pound of Cheese</i>							
Number of Plants	3	3	6	6	6	6	0
Processing Labor	\$0.0436	\$0.0694	\$0.0423	\$0.0812	<b>\$0.0491</b>	\$0.0550	-\$0.0059
Processing Non-Labor	\$0.0694	\$0.0858	\$0.0666	\$0.0918	<b>\$0.0729</b>	\$0.0821	-\$0.0092
Packaging	\$0.0261	\$0.0254	\$0.0134	\$0.0269	<b>\$0.0260</b>	\$0.0260	\$0.0000
Other Ingredients	\$0.0250	\$0.0242	\$0.0102	\$0.0309	<b>\$0.0248</b>	\$0.0140	\$0.0108
General & Administrative	\$0.0168	\$0.0238	\$0.0166	\$0.0269	<b>\$0.0183</b>	\$0.0269	-\$0.0086
Return on Investment	\$0.0050	\$0.0073	\$0.0034	\$0.0091	<b>\$0.0055</b>	\$0.0059	-\$0.0004
<b>Average Total Cost</b>	<b>\$0.1859</b>	<b>\$0.2359</b>	--	--	<b>\$0.1966</b>	\$0.2099	-\$0.0133
<b>Volume in Group (Lbs.)</b>	<b>483,085,670</b>	<b>131,594,818</b>	--	--	<b>614,680,488</b>	603,278,420	11,402,068
<b>% Volume by Group</b>	<b>78.6%</b>	<b>21.4%</b>	--	--	<b>100.0%</b>	100.0%	--

**Figure 18. Cheese Manufacturing Cost Allowance and Production**

For this study period, 83.1 percent of the cheese was processed at a cost less than the current manufacturing cost allowance of \$0.1988 per pound (Figure 18).

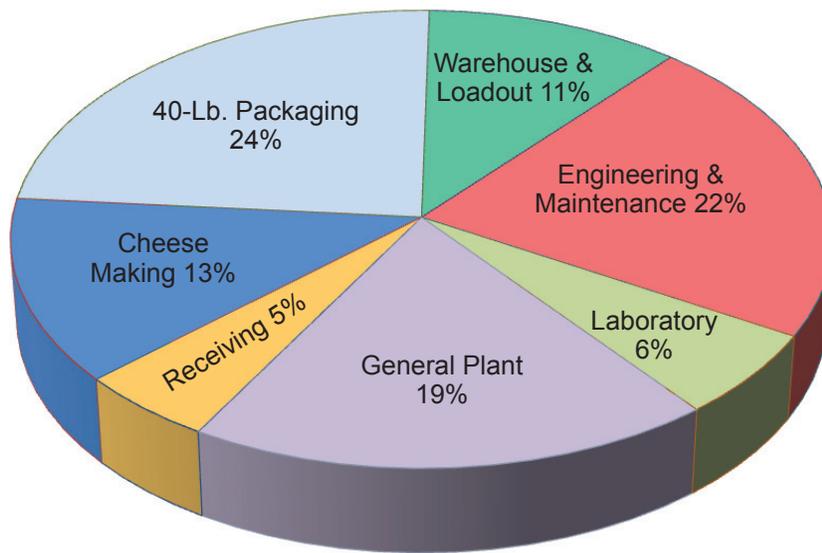


# Cheese Study

## Cheese Manufacturing Costs

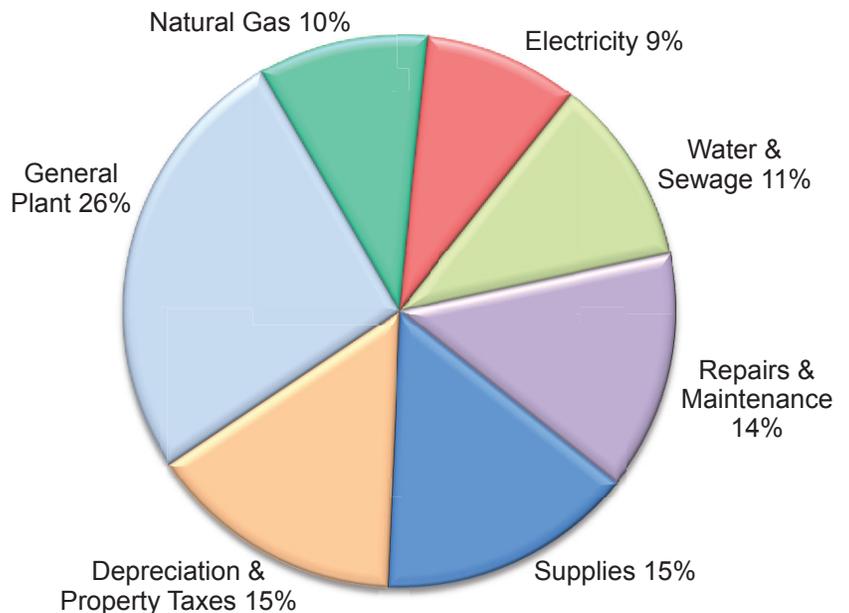
Processing labor costs were to \$0.0491 per pound, a decrease of 11 percent from 2008. For the plants that processed 500-lb. barrels or 640-lb. blocks, the weighted average packaging labor cost for 40-lb. block Cheddar cheese (\$0.0116 per pound) was substituted. General plant labor represented 19 percent of the processing labor cost (Figure 19) and included plant supervision and various general plant expenses.

**Figure 19. Cheese Processing Labor**



**Figure 20. Cheese Processing Non-Labor**

Processing non-labor costs were \$0.0729 per pound and accounted for 37 percent of the total manufacturing cost. General plant expenses accounted for 26 percent of processing non-labor (Figure 20) and included costs such as, plant insurance, outside storage, and rental expense.



# Cheese Study

Packaging costs included all non-reusable items, such as boxes, liners, tape, glue, and stretch-wrap. The weighted average packaging cost for 40-lb. block Cheddar cheese was substituted for those plants producing 500-lb. barrel or 640-lb. block cheese.

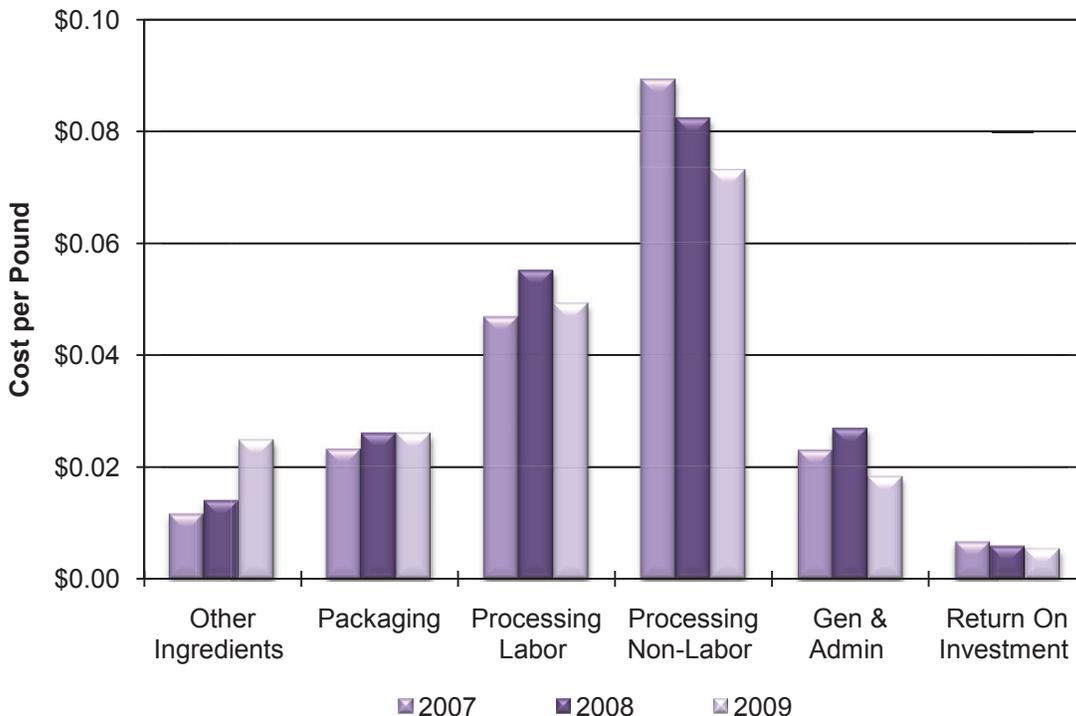
Other ingredient costs for Cheddar cheese included salt, color, rennet, etc. The weighted average cost rose to \$0.0248 per pound and accounted for 13 percent of the manufacturing cost.

General and administrative costs were \$0.0183 per pound, a 32 percent decrease from 2008, and accounted for 9 percent of the manufacturing cost.

Return on investment costs were \$0.0055 per pound, a 7 percent decrease from the prior year, representing 3 percent of the manufacturing cost.

The cost of manufacturing cheese dropped to \$0.1966 from \$0.2099 per pound the prior year. Figure 21 illustrates the changes that occurred in each category of cost over a three-year period.

**Figure 21. Cheese Manufacturing Costs 2007 to 2009**



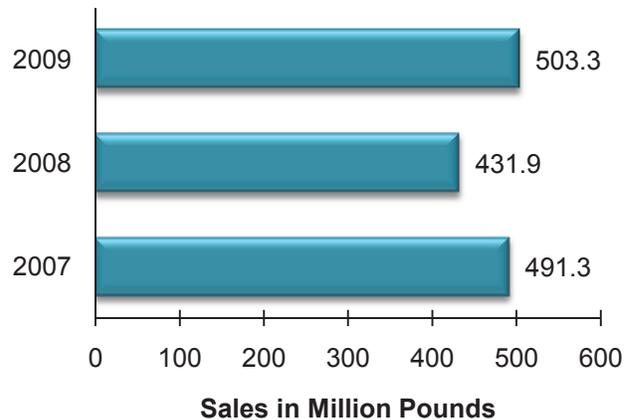
# Condensed Skim and Cream Overview

The manufacturing cost of bulk dairy products, such as condensed skim and cream, are not as precise as packaged products like butter, NFDM, and cheese. There are very few direct costs associated with bulk dairy products. Most, if not all, bulk dairy product costs are derived from the general plant costs allocated to them based on components (cwt.).

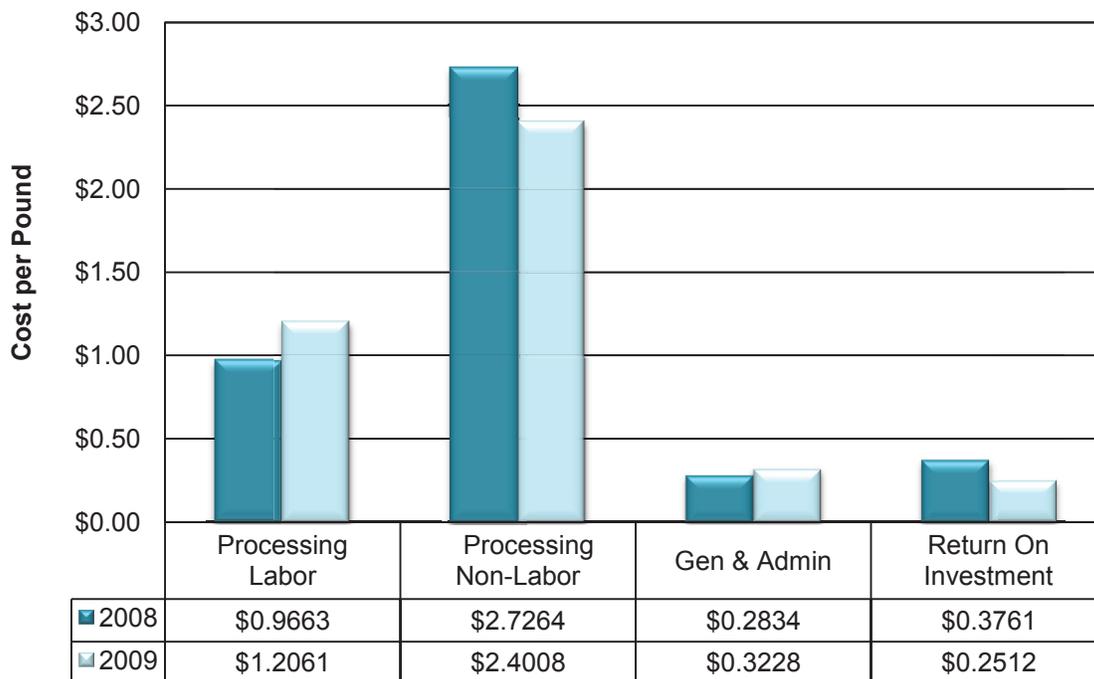
## Condensed Skim Overview

In 2009, the condensed skim study was completed on nine plants. Condensed skim sales were 503 million pounds, up nearly 17 percent over the 2008 study (Figure 22). The weighted average manufacturing cost of condensed skim was \$4.18 per cwt. in 2009. Labor costs increased 25 percent while return on investment costs decreased 33 percent over the prior year (Figure 23).

**Figure 22. Condensed Skim Sales 2007 to 2009**



**Figure 23. Condensed Skim Manufacturing Costs 2008 to 2009**

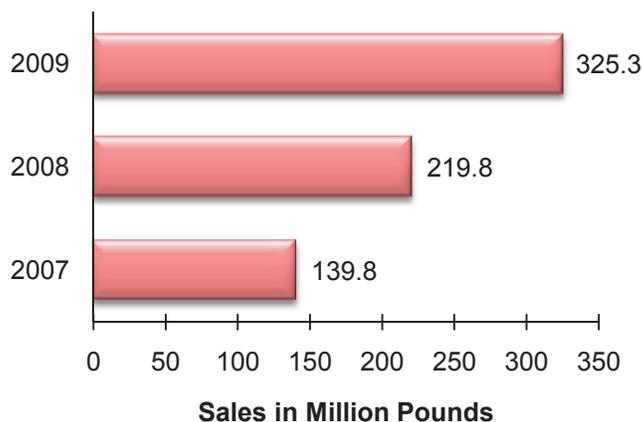


# Condensed Skim and Cream Overview

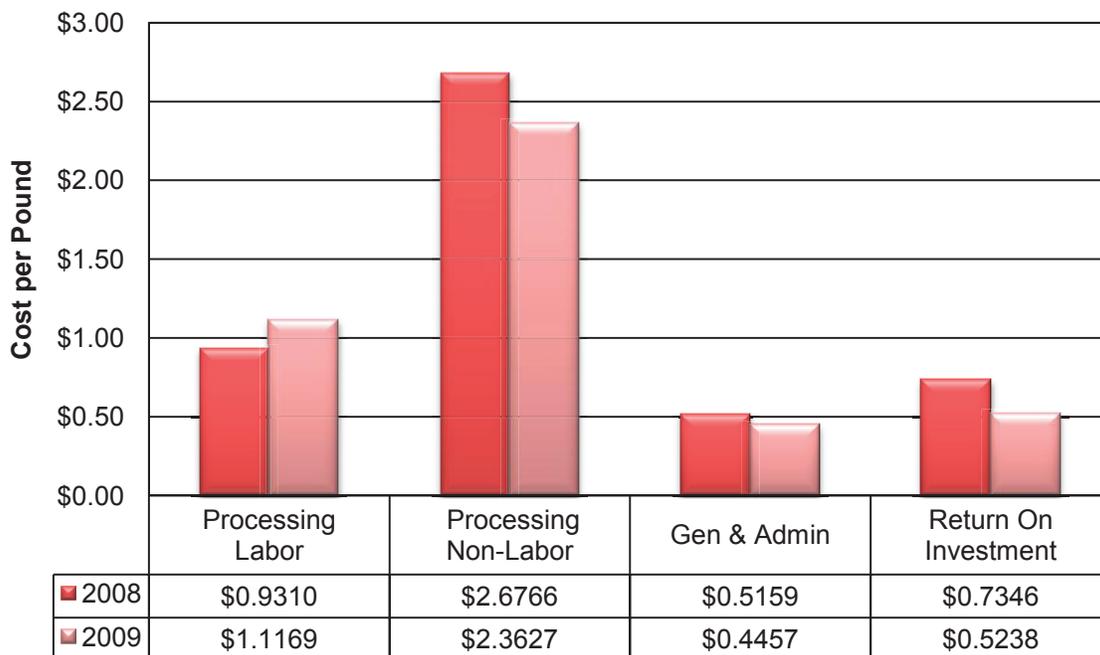
## Cream Overview

The cream study was completed on ten plants for the year 2009. Cream sales were 325 million pounds, up 48 percent from the prior year (Figure 24). The weighted average manufacturing cost of cream was \$4.45 per cwt. Labor costs increased 20 percent, and return on investment costs decreased nearly 30 percent (Figure 25).

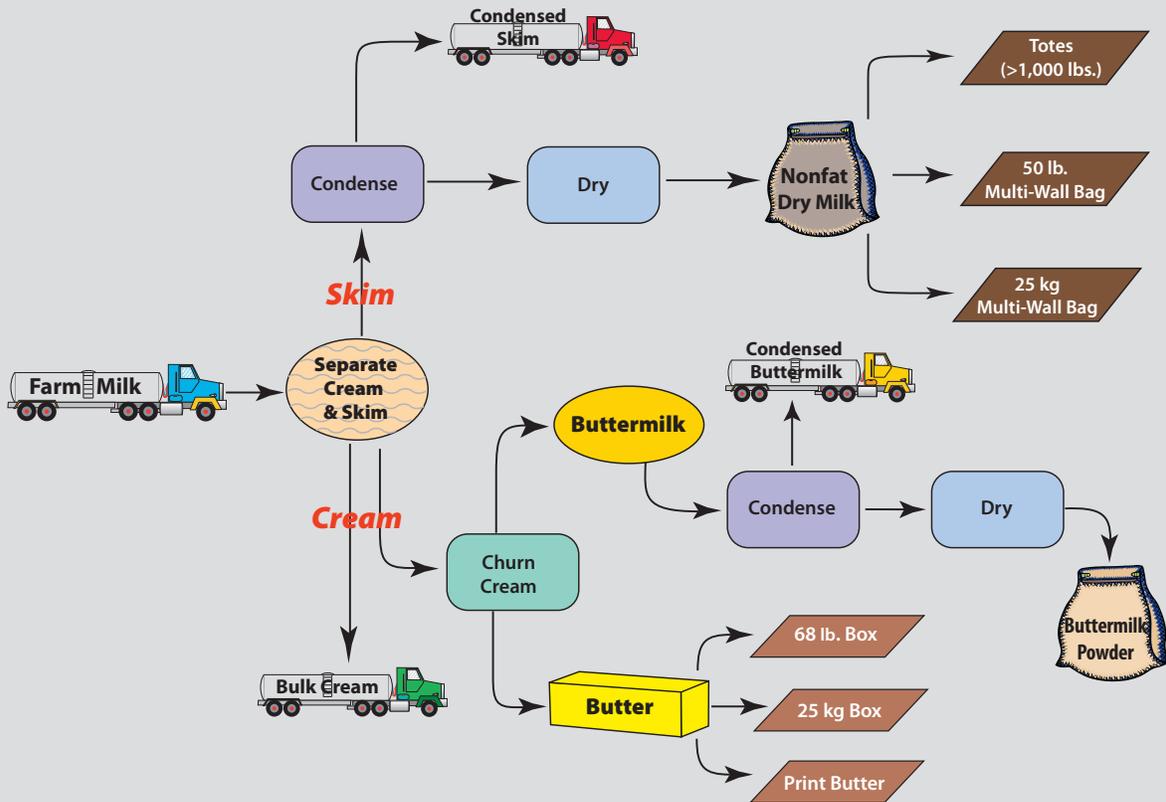
**Figure 24. Cream Sales 2007 to 2009**



**Figure 25. Cream Manufacturing Costs 2008 to 2009**



**Figure 26. Simplified Flowchart of a Butter and Nonfat Dry Milk Plant**



**Figure 27. Simplified Flowchart of a Cheese Plant with By-Product Processing**

