Testimony on Cost of Processing in Cheese, Whey, Butter and Nonfat Dry Milk Plants

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by

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Introduction

Judge Palmer and personnel of AMS Dairy Programs, I am appearing before you to offer a summary of a recent research project in which I collected data on and summarized the costs of processing in cheese, whey, butter and nonfat dry milk plants. I am not here to advocate for or against any particular policy action but rather to offer my insights into the current cost environment for dairy processors. This is a summary of my work and does not represent an official statement of Cornell University.

Cornell University has been conducting cost of processing studies in the dairy industry for more than 30 years. Over the past 20 years, work by the Cornell Program on Dairy Markets and Policy group included studies on the cost of processing cheese[1],[2], whey[3],

[1] Mesa-Dishington, Jens K., Richard D. Aplin, and David M. Barbano., "Economic Performance of 11 Cheddar Cheese Manufacturing Plants in Northeast and North Central Regions, Part 1 of a Research Effort on Cheddar Cheese Manufacturing.", A.E. Res. 87-2, Dept. of Agr. Econ., Cornell Univ., January 1987.

[2] Mesa-Dishington, Jens K., David M. Barbano, and Richard D. Aplin., "Cheddar Cheese Manufacturing Costs, Economies of Size and Effects of Different Current Technologies, Part 2 of a Research Effort on Cheddar Cheese Manufacturing.", A.E.Res. 87-3, Dept. of Agr. Econ., Cornell Univ., January 1987.

[3] Hurst, Susan, Richard Aplin, and David Barbano., "Whey Powder and Whey Protein Concentrate Production Technology, Costs and Profitability, Part 4 of a Research Effort on Cheddar Cheese Manufacturing.", A.E.Res. 90-4, Dept. of Agr. Econ., Cornell Univ., April 1990.

butter, nonfat dry milk powder [4],[5],[6],[7] and fluid milk [8]. This project assesses the costs of processing in cheddar cheese, dry whey, butter and nonfat dry milk plants and builds on knowledge and background of these earlier efforts. I was asked by dairy plants who had participated in the previous project [6], [7] to re-run the analyses with more recent data.

Plant Selection

In previous project, participating plants were selected to on the basis of a random draw stratified by plant size. Because the time was short between the request to update the study and this hearing, The plants who were previously asked to participate were the only plants asked to participate again. This had strategy had multiple advantages. One advantage is that plants were already familiar with the process of data collection. It also allows an opportunity to examine changes in processing costs in same-plants from a previous time period.

There were 21 plants who responded with data and of those plants, 19 submissions were deemed to have data without problems and are included in this summary. The other 2 plants will correct their data and send it in but, too late for inclusion in this summary. Of the 19 plants, 11 processed cheese, 7 processed dry whey, 4 processed butter and 7 processed nonfat dry milk.

Plants were asked to submit data corresponding to their most recently completed fiscal year. This ranged from the last quarter of 2005 through the second quarter of 2007. The bulk of observations occurred during the calendar year of 2006. Figure 1 shows the temporal dispersion of the data in this report.

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[4] Stephenson, Mark W. and Andrew M. Novakovic., "Manufacturing Costs in Ten Butter/Powder Processing Plants.", A.E.Res. 89-19, Dept. of Agr. Econ., Cornell Univ., September 1989.

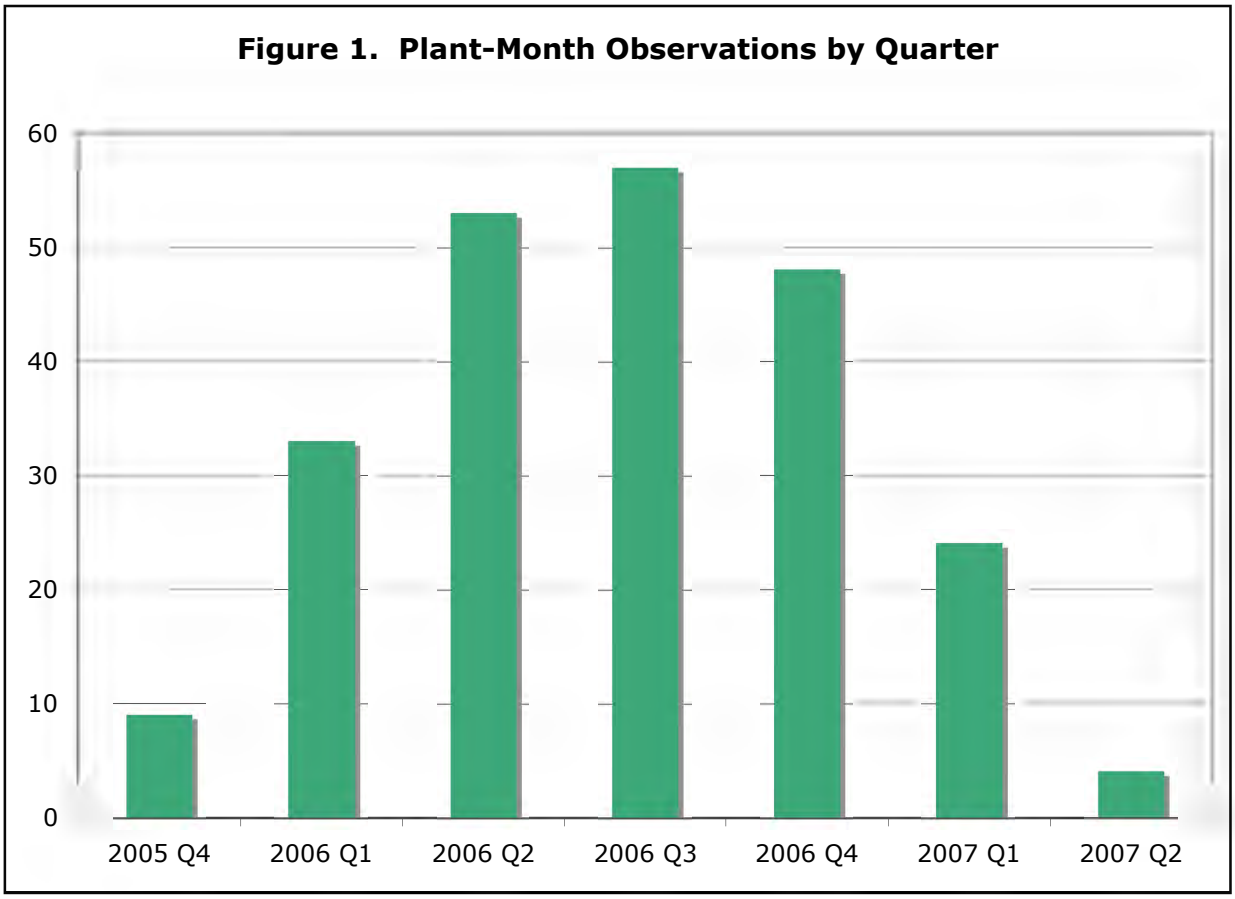
[5] Stephenson, Mark W. and Andrew M. Novakovic., "Determination of Butter/Powder Plant Manufacturing Costs Utilizing an Economic Engineering Approach.", A.E.Res. 90-6, Dept. of Agr. Econ., Cornell Univ., June 1990.

[6] Stephenson, Mark W., “Cost of Processing in Cheese, Whey, Butter and Nonfat Dry Milk Plants, Working Paper, AEM, Cornell University, July 7, 2007.

[7] Stephenson, Mark W., “Testimony on Cost of Processing in Cheese, Whey, Butter and Nonfat Dry Milk Plants”, Federal Milk Marketing Order Hearing, Strongsville, OH, September 14, 2006.

[8] Erba, Eric M., Richard D. Aplin, and Mark W. Stephenson., "Labor Productivities and Costs in 35 of the Best Fluid Milk Plants in the U.S.", E.B. 97-03, Dept. of Agr., Res., and Mgrl. Econ., Cornell Univ., March 1997.

Figure 1. Plant-Month Observations by Quarter



Data Collection

The previous project detailed the data collection and summary methods. It may be instructive to remind folks that data collection used a computer program developed to build a questionnaire based on responses to previous questions. For example, first identifying products produced at the plant generated subsequent questions about package sizes and monthly production of the individual products. And, identifying package sizes then generated questions about the packaging costs for those particular containers, etc. When surveys are complete, they are submitted as an email attachment or directly from within the program.

Methodology for collection and summary of the data closely follows the industry-accepted practices of the California Department of Food and Agriculture (CDFA). Anywhere plant expenses can be directly allocated to particular products, plants are asked to do so. A good example is utility expense where individual electric or gas meters can be recorded and assigned to a product line such as cheese or powdered products. Some expenses must be indirectly allocated to products.

As per CDFA's procedure, *Any cost that cannot be clearly assigned to a single product line is apportioned according to the percent of milk solids processed in the various product lines.* For example, a plant that brought in 100 pounds of raw milk and proc-

essed it into cheese, dry whey and whey cream might have sold 5.85 lbs of solids (fat and solids-not-fat) in the cheese, 6.12 lbs of solids in the dry whey and 0.20 lbs of solids in the whey cream. This would mean that $10,000 of unallocated electricity would be apportioned as $4,807 to cheese, $5,029 to dry whey and $164 to whey cream. Any other costs which are unallocated to specific product lines are apportioned indirectly in the same way as the electric cost example.

Direct allocation is of course best. But, the allocation by solids is generally a workable compromise where the detail is not available. In a butter-powder plant that sells only butter and nonfat dry milk, it is possible that indirectly allocated costs may be too heavily assigned to one of the products. However, all of the expenses of the plant are accounted for in the butter and nonfat dry milk cost estimates.

A more serious problem with indirect allocation can exist when products that are not reported in the study have received an inappropriate weighting of an expense. This occurred in the previous study but was caught between the publication of the working paper and the testimony that I gave. I opined at the testimony that the allocation change appeared to be unique to a single butter-powder plant.

Plants that sell a significant portion of total solids as intermediate products can fall into this allocation problem. For example, a butter-powder plant that sells a large amount of cream or skim milk, or even condensed product, can overstate the indirectly allocated expenses for those products and thus underestimate the true costs of producing butter or powder. Upon examination, more than the single plant from the previous testimony had this problem to a lesser, but significant degree. The attempt has been made to correct the problem this time in the summary. Ultimately, directly allocating expenses on the part of plants eliminates this problem.

Processing Cost Results

Although there were a reasonable number of plants participating in this data collection, I will not list them as groupings of “Low” and “High” cost plants to assure confidentially of individual plant data. I am reporting the weighted average costs by categories which correspond to CDFA’s reports on manufacturing costs.

Table 1. shows the weighted average processing costs for the 11 cheese plants participating in the project and Figure 2. shows the breakdown of the costs.

Table 1. Processing Costs for 11 Cheddar Cheese Plants.

	Pounds Cheese	Labor	Energy	Ingredients	Packaging	Repairs & Depreciation	G&A	ROI	Total
Weighted Average	118,711,332	$0.0400	$0.0165	$0.0251	$0.0238	$0.0334	$0.0076	$0.0119	$0.1584
Last time Wt Ave.	60,223,592	$0.0435	$0.0174	$0.0147	$0.0198	$0.0446	$0.0126	$0.0112	$0.1638

Figure 2. Breakdown of Cheddar Cheese Processing Costs.

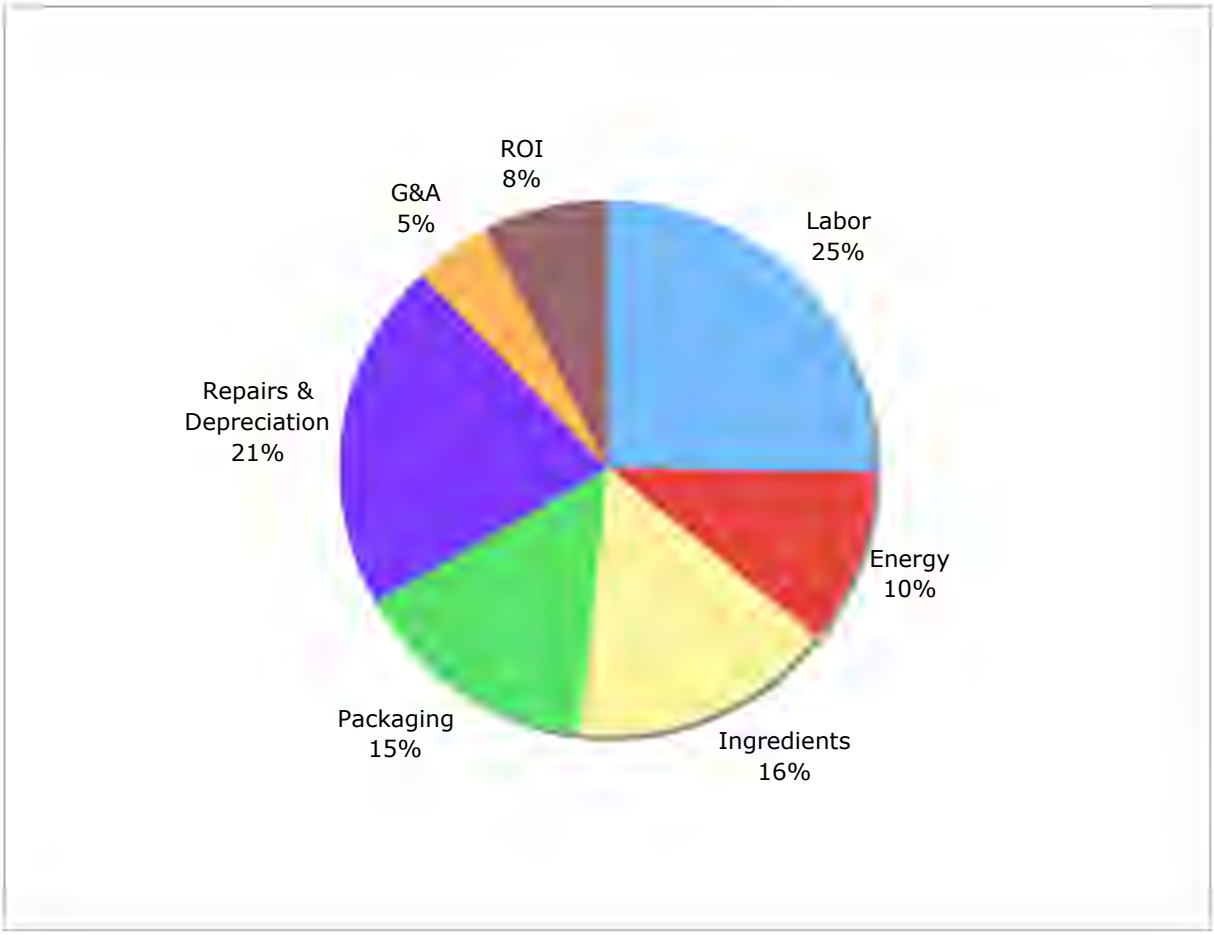


Table 1. also shows the weighted average costs from the project offered in the previous testimony. It may be noted that the total processing costs reported actually declined from the previous summary. However, it should also be noted that there are 3 large plants that are included in the current summary that were not included in the last report because their data was submitted too late for inclusion. Please note that the average annual pounds of cheese processed nearly doubled from the previous report. There are 8 plants which participated in both projects and allow a plant-by-plant comparison of the costs from the previous report and this one. Comparing same plants shows that processing costs have actually increased 1.7¢ per pound since the last study.

Table 2. shows the weighted average processing costs for the 7 dry whey plants participating in the project and Figure 3. shows the breakdown of those costs.

Table 2. Processing Costs for 7 Dry Whey Plants.

	Pounds Whey	Labor	Energy	Packaging	Repairs & Depreciation	G&A	ROI	Total
Weighted Ave	58,722,459	$0.0412	$0.0424	$0.0146	$0.0580	$0.0203	$0.0211	$0.1976
Last time Wt Ave.	47,394,657	$0.0416	$0.0347	$0.0108	$0.0593	$0.0262	$0.0216	$0.1941

Figure 3. Breakdown of Dry Whey Processing Costs.

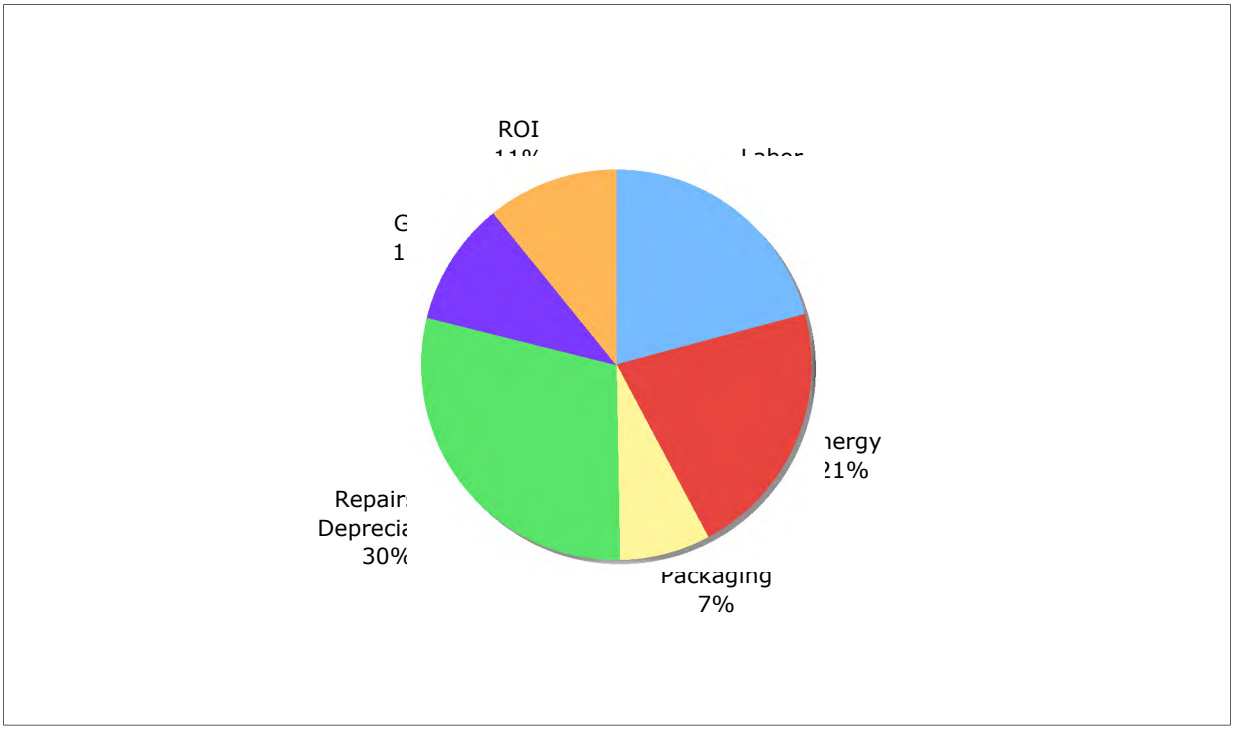


Table 2. highlights that dry whey processing costs have only modestly changed since the last report. Although the average annual pounds of whey processed is larger, and there are increases in energy and packaging costs, they are somewhat offset by smaller expenses for repairs, depreciation, general and administrative and return on investment. The total costs have increased by less than half a cent per pound. The same thing is shown by same-plant comparisons.

Table 3. shows the weighted average processing costs for the 4 butter plants participating in the project and Figure 4. shows the breakdown of the costs.

Table 3. Processing Costs for 4 Butter Plants.

	Pounds Butter	Labor	Energy	Ingredients	Packaging	Repairs & Depreciation	G&A	ROI	Total
Weighted Average	57,626,803	$0.0522	$0.0157	$0.0029	$0.0189	$0.0662	$0.0204	$0.0083	$0.1846
Last time Wt Ave.	60,223,592	$0.0435	$0.0174	$0.0019	$0.0198	$0.0574	$0.0126	$0.0112	$0.1638

Figure 4. Breakdown of Butter Processing Costs.

Table 3. indicates that butter plants have seen an increase in overall costs of processing—up a little more than 2¢ per pound. Average plant volume is similar but labor, non-milk ingredients, repairs and depreciation, general and administrative costs have all increased and are only partially offset by modest declines in energy, packaging and return on investments.

Table 4. shows the weighted average processing costs for the 7 powder plants participating in the project and Figure 5. shows the breakdown of the costs.

Table 4. Processing Costs for 7 Nonfat Dry Milk Plants.

	Pounds Powder	Labor	Energy	Packaging	Repairs & Depreciation	G&A	ROI	Total
Weighted Average	70,142,458	$0.0362	$0.0409	$0.0159	$0.0372	$0.0217	$0.0143	$0.1662
Last time Wt Ave.	55,066,936	$0.0339	$0.0315	$0.0143	$0.0359	$0.0196	$0.0072	$0.1423

Figure 5. Breakdown of Nonfat Dry Milk Processing Costs.

All of the same nonfat dry milk plants participated in this and the previous study. However, Table 4. shows that these plants on average processed considerably more product than in the previous time period. The plants are also showing a significant increase in the weighted average cost of processing—somewhat more than 2¢ per pound. This is due in part to real increases in some costs (labor, packaging, repairs and depreciation are good examples) and in part to the changes in the methodology of indirectly allocating costs. Energy is a particularly good example of using a better indirect allocation of costs in plants with significant sales of bulk liquid products.

Summary

In the previous study, the bulk of plant-month observations came during the 12 month time period of July 2004 through June 2005. This time, calendar year 2006 was where I had the majority of the observations. Over that year-and-a-half, plants have continued to observe increased costs of processing. These are most pronounced in the same-plant comparisons for cheese, butter and nonfat dry milk and less so for whey processing.

Energy was the most common cost center increase in all products. Labor also accounted for significant increases in costs across all products. And, for most products, increases in packaging costs were notable.

It is particularly true in nonfat dry milk plants that the indirect allocation method using pounds of solids sold can miss-apportion costs between products. In the last testimony, this has had the effect of understating the costs of processing nonfat dry milk. An attempt has been made to correct this problem in the summary of the data. And, a procedure will be implemented to correct the problem at the point of data collection in the future.

If you have any questions, I would be glad to try and answer them without divulging any confidential data.