An Analysis of the Impact of Deregulating The Pricing of Reconstituted Milk Under Federal Milk Marketing Orders

by

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Preface

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Abstract

This study reports an effort to improve estimates of the cost of reconstituted milk relative to fresh milk. The cost advantage of reconstituted milk is calculated for representative plants in six cities across the U.S. The implications for farm prices of lower cost reconstituted milk are discussed.

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Introduction

In August, 1979, the Community Nutrition Institute (CNI) and four individuals petitioned the Secretary of Agriculture to amend federal milk marketing order provisions related to the pricing of reconstituted milk.1/ Current provisions essentially require regulated handlers to pay the difference between the Class I price and the basic formula price (this difference is usually called the Class I differential) on the milk equivalent of all dried or condensed milk used to produce Class I (fluid) milk products. The CNI essentially proposed that reconstituted milk be classified in the lowest use class (Class III in most orders) even if the reconstituted milk was used to make or was sold as a beverage milk product that would otherwise be considered a Class I product.

1/ Reconstituted or partially reconstituted milk products can be made in several ways, can refer to various and quite different products, and can and are called by several names. In this study, the term "reconstituted milk" denotes fluid milk products that are made from condensed, dried, or other manufactured milk products and contain no fresh fluid milk products and no nondairy products. The term "blended milk" refers to mixtures of reconstituted milk and fresh milk. Fluid milk products with non-dairy components, such as vegetable fat, are called "filled milk."

After soliciting opposing viewpoints and allowing time for additional studies, the Secretary of Agriculture denied the request for a hearing in April 1980. During the course of the USDA review, the petitioners initiated legal action against the Secretary. The case was dismissed in court on the grounds that the petitioners either had no legal standing or had not exhausted administrative procedures. So, the merits of the CNI proposal have never been discussed in either an administrative or judicial hearing. (See Novakovic and Story for an additional discussion of the issues and other descriptive information.)

Previous Research

Two studies of the impact of changing federal order pricing provisions for reconstituted milk have been reported and widely discussed. Hammond et al. appear to have done the seminal work. They estimate the impact of regional reductions in Class I prices that are derived from regional estimates of the cost of reconstituted milk. The principal justification for the current geographic pattern of Class I prices is that the price of (Class I) milk in an area must be no less than the cost of alternative fresh milk supplies from the large surplus milk producing region in the Upper Midwest. Hammond et al. argue that reconstitution provides for a lower cost alternative to fresh milk and that the Class I price in a given region would drop to match the value of the lowest cost alternative to local fresh milk, i.e., reconstituted milk.

A USDA study of reconstituted milk essentially takes the same approach but it expands the number of alternatives and impacts estimated by Hammond, et al.

Objectives

Both of the aforementioned studies concentrate on the impact of lowering Class I prices; however, neither pay a great deal of attention to carefully evaluating the cost of reconstituting milk nor the conditions in which reconstitution would likely take place. This study attempts to contribute to the dialogue on reconstituted milk by offering more precise estimates of the cost of reconstituting milk and then relating those cost estimates to possible changes in Class I prices.

Methodology

The results reported herein come from an extension of a study by Novakovic and Aplin. Some of the assumptions used in the earlier study have been made more realistic; however, the structure of the cost model is basically the same. The reader is referred to the previous report for more extensive details, but a general description of the model and the changes that have been made to the earlier model are briefly presented below.

An economic-engineering framework is used to estimate the cost advantage of reconstituted milk over fresh milk. The cost figure compares the costs of two hypothetical processors who are alike in all respects except that one sells totally fresh milk products and the other sells some totally fresh and some blended milk products. (For the sake of brevity, the latter is referred to as a partially reconstituted milk processor.) The cost figure is intended to be comprehensive in that it includes all sources of costs that would be incurred from the point raw products are purchased and received, through processing, and to the point finished products are loaded and sold. This includes processing costs, capital costs, and raw ingredient costs but it excludes assembly and distribution costs. Moreover, it also includes revenues from the sale of finished products. Hence, a net cost is calculated for a totally fresh milk processor and a net cost is calculated for an otherwise identical partially reconstituted milk processor. The difference between the net costs for these processors is the cost advantage of reconstituted milk, i.e. the cost savings attributed to the reconstitution process. By our definition, if the totally fresh milk processor has a higher net cost than his partially reconstituted milk processing twin, then the cost advantage of reconstituted milk is positive. The cost advantage is negative if the opposite holds true.

In the earlier study by Novakovic and Aplin, the cost advantage of reconstituted milk was calculated for plants of two sizes located in six cities across the U.S. and under various assumptions about the relative amount of blended milk produced, the solids-not-fat content of blended milk products, the prices paid for variable factors, and other aspects of the processing or economic environment.

In this study, the assumptions about the processing environment are reduced to describe a representative plant for each of the six cities; that is, the type of plant and processing environment that would be most likely in each of the six geographic locations. Table 1 summarizes the characteristics of the representative plants for Boston, Chicago, Dallas, Jacksonville, Knoxville, and New York.

In the earlier study, plants were assumed to be of two sizes, reconstituted skim milk could be made from two raw ingredients (and water), and the relative amount of blended milk in the product mix could be of two levels. The plant size chosen for the representative plant in each city was primarily based on the size of the city. Although plant capacity in the U.S. averages not quite 30,000 gallons/day, the large majority of the beverage milk produced is processed in much larger plants. Hence, only the two smaller cities, which are less likely to be dominated by very large plants, are represented by the smaller plant size.

Table 1. Characteristics of Representative Plants by Location

City	Plant Size (gallons/day)	Raw Ingredient	Blended Volume
Boston	100,000	condensed skim	10%
Chicago	100,000	condensed skim	50%
Dallas	100,000	nonfat dry milk	50%
Jacksonville	30,000	nonfat dry milk	10%
Knoxville	30,000	nonfat dry milk	50%
New York	100,000	condensed skim	10%

Raw ingredients and blended milk volumes were chosen that would maximize the cost advantage of reconstitution given the pre-selected plant size and the costs estimated in our earlier study.

In addition to these characteristics, all plants are assumed to standardize blended milk at the prevailing legal minimum of 8.25 percent solids-not-fat (SNF) instead of the U.S. average SNF content of fresh beverage milk of 8.7 percent. As is explained in the earlier report, the lower SNF standard reduces the comparative cost by about 2 cents per gallon of blended milk. This result is virtually constant across all combinations of other assumptions, hence, it is not explored further here.

Comparative costs of reconstitution are estimated for each plant and location for three combinations of alternative economic assumptions, as shown in Table 2.

Table 2. Assumptions Describing the Test Cases

Case	Class I Price	Reconstituted Pricing
1	order minimum prices	unregulated
2	order minimum prices	regulated
3	over-order prices	unregulated

One assumption deals with the price of raw Class I milk. In our earlier study, it was assumed that the appropriate Class I price was the federal order minimum. With the exception of processors in New York, processors typically pay higher prices than federal order minimums; thus the advantages to them of reconstitution are underestimated when minimum Class I prices are used. The reliability of readily available data on actual prices paid for Class I milk by processors is somewhat questionable; hence results using both federal order minimums and rough estimates of over-order prices are reported. The over-order prices used are the Class I prices announced by the major cooperative in each city. These price announcements may or may not correspond to the actual price paid.

The second assumption refers to the pricing of reconstituted milk. The cost advantage of reconstituted milk is calculated when reconstituted milk is priced in Class I (regulated), as is currently done, and when current provisions are ignored (unregulated), i.e., reconstituted milk is not priced under an order.

Results

The average cost advantage of the partially reconstituted milk processor over the totally fresh milk processor in each city for the three test cases is shown in Table 3. In general, the results show that there is no cost advantage to reconstituting milk under current federal order pricing provisions (Case 2). When these provisions are ignored and federal order minimum prices prevail (Case 1) the cost advantage associated with reconstitution ranges from less than zero to 5 cents per gallon of blended milk. There is virtually no cost advantage in Chicago and rather modest cost incentives to reconstitution in Dallas and Knoxville. However, when over-order prices are used there is a cost advantage to reconstitution in every city.

Table 3. The Average Cost Advantage of Reconstituted Milk in Six Cities for Three Test Cases in 1980 and 1981 (cents per gallon of blended milk).

City	Case 1		Case 2		Case 3	
	1980	1981	1980	1981	1980	1981
Boston	2.9	4.9	-7.1	-5.9	3.6	5.8
Chicago	-1.7	0.6	-4.3	-2.6	0.6	2.6
Dallas	0.3	1.5	-5.0	-4.3	1.4	2.8
Jacksonville	0.7	2.7	-9.1	-8.0	6.8	9.5
Knoxville	-0.1	1.2	-4.6	-3.9	2.6	3.5
New York	1.8	3.9	-7.1	-6.1	N.A.	N.A.

The difference between costs for case 1 and case 2 is a measure of the cost of current pricing provisions. Similarly the difference between costs for case 1 and case 3 are a measure of the additional advantages of reconstitution due to the prevalence of over-order pricing. These differences are shown in Table 4. The largest savings attributed to reconstitution would result from deregulation of reconstituted milk pricing. The cost of current pricing provisions ranges from 2 to 11 cents per gallon of blended milk. Over-order pricing increases the cost advantages of reconstituted milk by another 1 to 7 cents per gallon.

Table 4. Increases in the Cost Advantage of Reconstituted Milk Due to Deregulation and the Prevelance of Over-Order Prices

City	Increases in the Cost Advantage of Reconstitution Due to:			
	Deregulation		Over-Order Prices	
	1980	1981	1980	1981
Boston	10.0	10.8	0.9	0.9
Chicago	2.6	2.0	2.3	2.0
Dallas	5.3	5.8	1.1	1.3
Jacksonville	9.8	10.7	5.1	6.8
Knoxville	4.5	5.1	2.7	2.3
New York	8.9	10.0	--	--

Differences in cost due to deregulation or over-order pricing are relatively constant between 1980 and 1981. Annual differences in the cost advantage of reconstitution from year to year appear to be due primarily to the differences in the underlying price of milk (federal order minimums) and the price of the raw ingredient (dry or condensed skim milk).

If the price paid for Class I milk is reduced, the advantage of reconstituting milk is reduced. (This is the central point of the studies by Hammond et al. and the USDA.) Table 5 reports the prices for Class I milk that would eliminate the incentives for fresh milk processors to convert part of their output mix to blended milk products under the assumptions of Case 1. The difference between these breakeven prices and actual Class I minimum prices is reported as the reduction in Class I prices required to eliminate incentives to reconstitute. It, of course, must be recognized that reductions of federal order minimums by these amounts would not be successful by themselves due to the prevalence of over-order prices. The reduction in actual market prices paid for Class I milk would have to be greater than the figures reported in Table 5.

Table 5. Reductions in Class I prices Required to Eliminate the Cost Advantage Associated with Reconstituted Milk, Based on Annual Average Costs for 1980 and 1981 When Federal Order Minimum Prices and Current Pricing Provisions Prevail (Case 1).

City	Cost Advantage		Actual Class I Price		Breakeven Class I Price		Reduction in Class I Price	
	1980	1981	1980	1981	1980	1981	1980	1981
	(¢/gal.)		($/cwt.)		($/cwt.)		($/cwt.)	
Boston	2.9	4.9	14.59	15.50	13.78	14.16	.80	1.34
Chicago	-1.7	0.6	12.93	13.84	N.A.	13.48	0	.36
Dallas	0.3	1.5	13.99	14.90	13.87	14.28	.12	.62
Jacksonville	0.7	2.7	14.51	15.43	14.33	14.73	.18	.70
Knoxville	-0.1	1.2	13.75	14.68	N.A.	14.18	0	.50
New York	1.8	3.9	14.28	15.26	13.80	14.24	.48	1.02

If the prices announced and reported by dominant cooperatives are a reasonably accurate measure of the actual price paid, then the market prices would have to be reduced by approximately an additional 20¢ in Boston, 80¢ in Chicago, 45¢ in Dallas, $1.65 in Jacksonville, and $1.00 in Knoxville.

Conclusions

The possibility that modern production and marketing technology could render blended beverage milk products a very good substitute for fresh beverage milk products challenges the current basis for the geographic alignment of Class I prices. If Class I prices for local milk in a region are to be set no less than the cost of alternative milk supplies, then the cost of reconstituted milk supplies suggests that Class I prices could be reduced throughout the country, although perhaps not by as much as has been suggested by others.

Differences in the designs and time frames of the studies suggests that comparisons between these results and the findings of earlier studies should be made carefully and cautiously. Nevertheless, it may be useful to compare these results with those of Hammond et al. The latter study calculated breakeven reductions in Class I prices for regions in the U.S. for 1976. They estimate a short run reduction of $1.08 in the Northeast, $0.14 in the Lake States, $0.83 in the South Central States, and $1.57 in the Southeast (p. 16).

Our results suggest that the reductions calculated by Hammond et al. may be high or that prices for dry and condensed skim milk have increased relative to Class I prices since 1976, such that a smaller reduction is required now. Again, such comparisons may be inappropriate and misleading but at least they highlight the differences in the policy implications of the two studies.

The undisputed prevalence of over-order pricing further complicates matters. Hammond _et al_. argue that if Class I prices were reduced sufficiently, whatever the exact amounts are, then the incentive to reconstitute would be eliminated and there would, in fact, be very little reconstituted or blended milk sold. Whether or not a reduction in minimum Class I prices would have that effect depends entirely on how such reduction would affect over-order prices. Deregulation of reconstituted milk prices and a concomittant drop in minimum Class I prices consistent with Table 5 would more likely result in a significant move towards reconstitution until over-order prices were brought in line with the new federal order minimums. The end result could be similar, but this is a rather different scenario than that sketched by Hammond _et al_.

An alternative to reducing Class I prices that may be less consumer oriented but which may also be less disruptive might be to simply keep reconstituted milk prices regulated but reduce the so-called compensatory payments charged on reconstituted milk. As case 2 in Table 3 amply illustrates, current pricing policy puts a large penalty on reconstituted milk rather than simply equalizing its cost with fresh milk, as the policy was intended to do. A reduction in the compensatory payment that would more nearly equalize the costs of reconstituted and fresh beverage milk products would be more equitable than the current policy. It might be a step in the right direction that would also allow time for the further analysis of more drastic measures.

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