



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

ADMINISTERED PRICING BY COOPERATIVES: EFFECT ON PRODUCER AND CONSUMER PRICES AND SALES OF FLUID MILK

D. H. Carley

Considerable controversy exists with regard to pricing agricultural commodities, especially when pricing departs from classical market concepts dependent on equating supply and demand [1, 5, 6]. In a recent study of alternative Class I pricing systems, it was suggested that "pricing of milk and dairy products is one of the major policy issues to be resolved in the 1970s" [8]. A different pricing system in federal milk orders was considered urgent enough that a concentrated study of pricing alternatives was pursued by the U.S. Department of Agriculture [9].

Under the federal order classified system for pricing milk, price supports have provided a floor for manufacturing grade milk prices. Class I prices for milk used in fluid products have been based on the price for manufacturing grade milk plus a price differential in each market. In recent years, however, producer cooperatives have negotiated market-wide Class I prices that are above the minimum established by the order. More recently, Class I prices have become announced prices by the cooperatives rather than negotiated.

Milk pricing under federal orders has been frequently referred to as "administered pricing." Present pricing by the cooperatives meets the definition of administered pricing even more so than federal order pricing. Under the former, prices are set by action of the seller and remain the same for a period of time and a series of transactions [7]. Usually more of the product is offered for sale than is currently demanded, but demand may exceed supply. In this case, rationing may occur other than through a price change. Manufacturing industries such as auto, steel, textiles, etc. have operated successfully within an administered pricing framework. Production schedules are adjusted, from temporarily closing entire plants to working three

shifts, in order to control production and thus maintain quoted prices. Administered pricing is a rather recent occurrence in the pricing of agricultural products, especially at the farm level.

The objectives of this study were to analyze and interpret the actions and results of administered pricing of Grade A fluid milk. In evaluating timing and ability of a regional milk producer cooperative to change prices in line with changes in estimated production costs and federal order prices, the study had two ends. These are to analyze the relationship of producer and retail prices of fluid milk products, and to evaluate price-quantity relationships at the retail level. Determining linkage between changes in milk production and consumption, in terms of responsiveness to price changes within the administered pricing framework, was the overall objective.

DATA AND METHODOLOGY

Data used in the analysis were monthly prices for Class I milk, estimated retail prices for fluid whole milk, and sales of fluid milk, by type of product, in the Georgia Federal Milk Marketing Order area for 1970-1975. In addition, an index was used to estimate changes in the cost of producing milk. The methods and data input for the production cost index are explained in detail elsewhere [2].

Milk sales, by product types, within the defined milk marketing area were adjusted to pounds daily average sales per capita per month. Sales were adjusted for variation resulting from seasonality and calendar day composition [3]. For purposes of analysis, all prices were adjusted to a one-half gallon equivalent unit.

Ordinary least squares was used to estimate relationships resulting from administered pricing of

fluid milk at the producer level. The following functional relationships were estimated:

$$PAP_t = f(FOP_t) \quad (1)$$

$$PAP_t = f(PCI_t) \quad (2)$$

$$FOP_t = f(PCI_t) \quad (3)$$

$$RP_t = f(PAP_t) \quad (4)$$

$$FMS_t = f(RP_t, T) \quad (5)$$

$$FMS_t = f(PAP_t, T) \quad (6)$$

where

PAP_t = Producer administered Class I price in cents per one-half gallon (in quarter t for equations 1-3, in month t for equations 4-6),

FOP_t = Federal order minimum Class I price in cents per one-half gallon (in quarter t),

PCI_t = Production cost index in percents (in quarter t),

RP_t = Retail price fluid whole milk in cents per one-half gallon (in month t),

FMS_{it} = Fluid milk sales for product in pounds daily average per month per capita (product i in month t),

T = Trend, monthly with origin January 1970; 1,2,3 . . . n .

BENEFITS TO PRODUCERS

In a previous study of milk pricing alternatives it was concluded that (1) prices should change whenever basic economic conditions affecting milk production and consumption are substantially altered, and (2) such price changes should be based upon recent and reliable information [9]. Two questions emerge with regard to administered pricing of milk: (1) what are the conditions necessary for administered pricing and (2) how well does such pricing conform to the conditions suggested by the Advisory Committee?

Conditions for a successful administered pricing system for an agricultural product are (1) management of the supply by some individual or group such as a producer cooperative, (2) a product with continuous production or, if produced seasonally, adequate storage and/or processing capacity, (3) ability to spatially shift supply among consumer markets and/or among products, (4) willingness to adjust price down as well as up—depending on pressures from adjacent production areas with regard to supply, price, and general supply-demand conditions and

(5) a system assuring minimum prices, such as that under the price support program and/or the federal order program, if the administered pricing system should break down.

If a group is strong enough to manage supply to the extent of obtaining windfall profits through administered pricing, then the group may choose not to change prices when economic conditions warrant. They may ignore recent information in making pricing decisions. Administered pricing is a method by which price level of the supply produced can be made to coincide with that of inputs in the production function. With the ability to manage supplies (not so much to direct production but to direct supplies produced), spatially and by product form, the cooperative is in a position to announce its price in advance for supplies that will enter the market as fluid products.

Analysis of the administered pricing system used in the Georgia fluid milk market by regional cooperatives was based on (1) differences in the federal order minimum and administered Class I prices, (2) relationship between the two and (3) the relationship of administered Class I prices and the cost of production.

In every month (January 1970-October 1975) the administered price for Class I milk was above the federal order minimum price (Figure 1). The monthly differenced averaged 32 cents per hundredweight in 1970, increased to 47 cents in 1973, and averaged \$1.29 in 1974 and \$1.12 in 1975. Difference in prices resulted in added returns to members of the major producer cooperative in Georgia of over \$23.4 million in a 76-month period [4].

A close relationship was indicated between the administered Class I price and the federal order minimum Class I price. Equation 1, using a log linear model, showed the following relationship of the administered price to the federal order price on a quarterly basis,

$$\text{Log } PAP_t = -0.2496 + 1.1805 \text{ Log } FOP_t \\ (0.0703)$$

$$R^2 = 0.937$$

where the number in parentheses is the standard error of the regression coefficient. For each 10 percent change in the federal order price, the administered price changed 11.8 percent. This strongly indicates that the cooperative followed a pattern of announcing price changes in line with changes in the federal order price.

Economic conditions, especially during late 1972 and thereafter, resulted in drastic increases in costs of

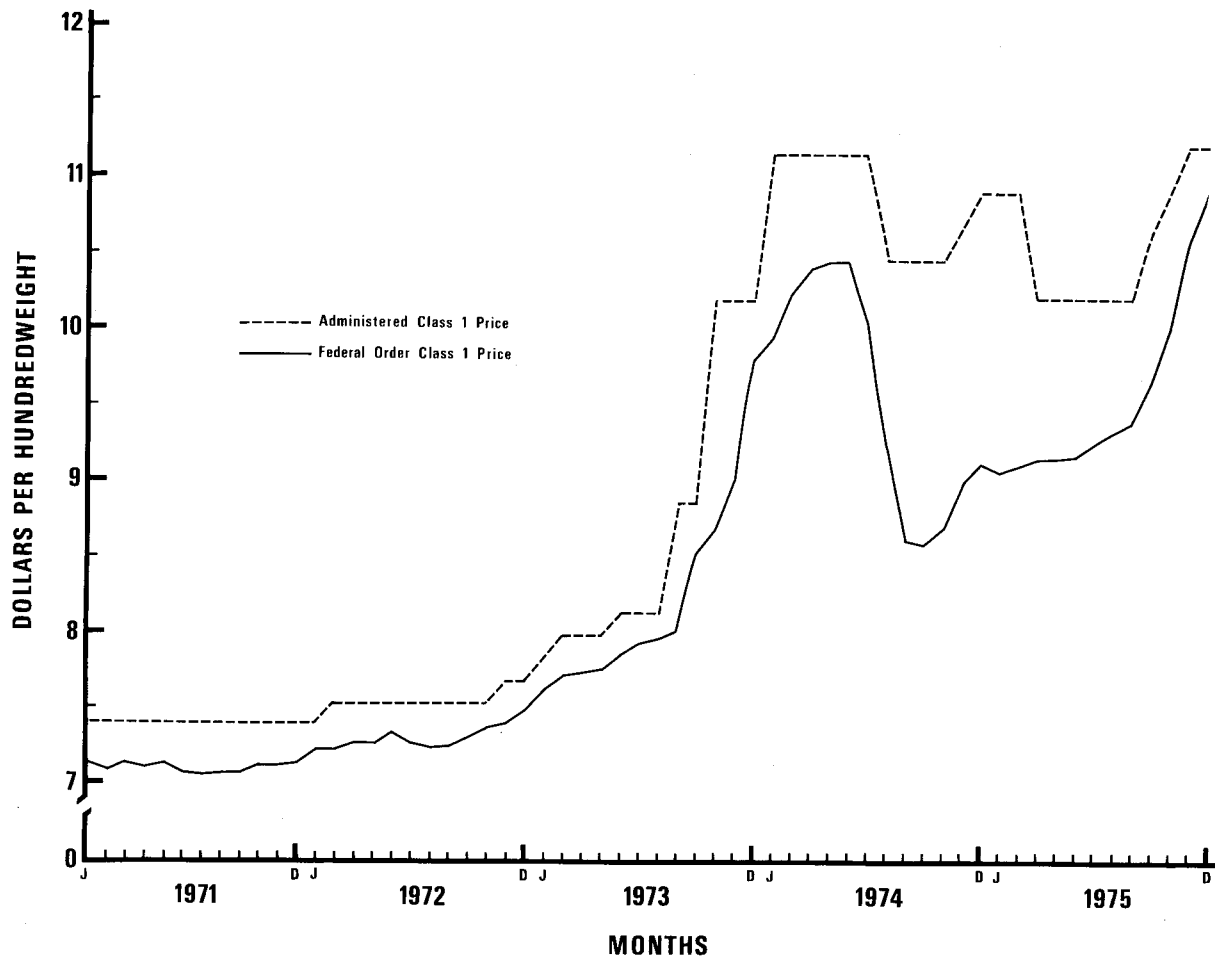


FIGURE 1. ADMINISTERED AND FEDERAL ORDER CLASS I PRICES, GRADE A MILK, GEORGIA, MONTHLY, 1971-1975

feed and other dairy production inputs. One measure of the effectiveness of administered pricing is its ability to adjust to changing costs. Comparison of administered pricing and federal order pricing indicates that administered prices showed a somewhat closer relationship to production costs than did federal order prices (Table 1).

The production cost index was lagged one quarter on the basis that producer price changes usually will not correspond with and will actually lag production cost changes. The lagged equation shows that for each 10 percent change in the production cost index, the administered price changed about 9.8 percent in the same direction. The corresponding equation for the federal order price showed a 7.6 percent change for a 10 percent change in the production cost index. These relationships indicate that administered pricing was used to initiate price changes in line with cost changes.

THE EFFECT ON FLUID MILK SALES

With administered pricing, evidence indicates that the producer cooperative was able to adjust to higher production costs in the form of higher Class I prices. Also, the higher Class I prices were passed along, resulting in increased retail prices. The equation for the relationship based on monthly prices was

$$RP_t = 22.2216 + 1.4575 PAP_t \quad R^2 = 0.974 \\ (0.0304)$$

showing that for a 1.0 cent increase per one-half gallon in the producer price, retail prices of whole fluid milk increased 1.45 cents. The retail price increase was greater than could be justified by the increase in the raw product cost. Higher processing, distribution and retailing costs, then, were also passed on.

TABLE 1. ESTIMATED LEAST-SQUARES COEFFICIENTS FOR EXPLAINING CLASS I PRICE RELATIONSHIPS TO COST OF PRODUCTION, GEORGIA, QUARTERLY, JANUARY 1970-MARCH 1975

Dependent variable (cents per one-half gal.)	Intercept	Estimated coefficient for	
		Production cost index ^a	R ²
FOP _t ^b	-0.0690	0.7551 (0.0753) ^d	0.841
FOP _t ^c	-0.0779	0.7625 (0.0776)	0.836
PAP _t ^b	-0.4712	0.9576 (0.0694)	0.909
PAP _t ^c	-0.5086	0.9794 (0.0632)	0.927

^aRange or production costs index 106.4 to 166.1; 1967=100.

^bThe log models were: Log FOP_t and $\text{Log PAP}_t = b_0 + b_1 \text{Log PCI}_t$.

^cThe log models were: Log FOP_t and $\text{Log PAP}_t = b_0 + b_1 \text{Log PCI}_{t-1}$.

^dNumbers in parentheses are standard errors of the regression coefficients.

About 96 percent of the variation in per capita daily sales of fluid whole milk was explained by retail prices and trend (Table 2). For a 10 percent increase in retail prices per capita, sales of whole milk decreased about 4.7 percent. Per capita sales also trended down.

Retail price data were not available for each fluid milk product, so quantity-price relationships were not determined on such a basis. The administered Class I price, which was the raw product price for each of the fluid milk products, was used as the price variable. This price would indicate the quantity-price relationship at the producer level.

Whole milk, lowfat and skim milk per capita sales were negatively related to price. Sales of whole milk decreased 2.9 percent for each 10 percent increase in the Administered Class I price. Sales of lowfat and skim milk decreased 3.5 for a 10 percent price increase. However, flavored milk decreased over 11 percent for a 10 percent Class I price increase, indicating a much more elastic relationship. Sales of lowfat, skim and flavored milk all had significant increasing trends.

Per capita sales of total fluid milk products had a

highly inelastic relationship to administered Class I prices. A 10 percent increase in Class I price resulted in a 2.9 percent decrease in sales. However, total sales trended upward. The variables, Class I price and trend, explained about two-thirds of the variation in total fluid milk sales.

IMPLICATIONS

Class I milk prices to producers were more closely related to production cost changes with the administered pricing system than with federal order minimum Class I prices. However, the administered price was undergirded by federal order price, which decreased the risk to the producer cooperative in its endeavor to obtain higher prices.

With a 10 percent change in the production cost index, the administered Class I price increased 9.8 percent. This was passed on to the consumer through a higher retail price. A 9.8 percent increase in the administered Class I price resulted in a decrease of 2.9 percent in per capita daily whole milk sales, a 3.4 percent decrease in lowfat and skim milk sales, and a 2.8 percent decrease in total fluid milk product sales.

TABLE 2. ESTIMATED LEAST-SQUARES COEFFICIENTS FOR EXPLAINING RELATIONSHIPS OF FLUID MILK PRODUCT SALES TO PRICES, GEORGIA, MONTHLY, JANUARY 1970-APRIL 1975

Dependent variable ^a	Intercept	Regression coefficients for			R ²
		Retail price RP _t	Class I price PAP _t	Trend	
<u>Per capita sales (lbs.)</u>					
Fluid whole milk	0.5318	-0.4676 (0.0405) ^b		-0.0004 (0.0001)	0.957
Fluid whole milk	0.1184		-0.2931 (0.0235)	-0.0006 (0.0001)	0.961
Lowfat and skim	-0.6428		-0.3520 (0.0527)	0.0071 (0.0002)	0.984
Flavored milk	-0.0379		-1.1136 (0.3169)	0.0091 (0.0012)	0.603
Total fluid products ^c	0.1789		(0.0269)	(0.0001)	

^aThe model used was: $\log Y_{it} = b_0 + b_1 (\log RP_t \text{ or } \log PAP_t) + b_2 T$.

^bNumbers in parentheses are standard errors of the regression coefficients.

^cIncludes whole milk, lowfat and skim milk, flavored milk and buttermilk.

Administered pricing is a method for increasing prices to producers corresponding with production cost increases. This analysis shows the linkage of changes in milk production costs, producer prices. It also indicates, indirectly, prices to retail

sale changes. The study implies a need for additional analysis concerning relative price levels, timing of price changes and the problems concerning milk supplies that are not sold in the fluid milk market.

REFERENCES

- [1] Carley, D. H. "Discussion: Agricultural Prices in the 1970's, How Will Value Be Established," *Southern Journal of Agricultural Economics*, Volume 6, Number 1, pp. 33-34, 1974.
- [2] Carley, D. H. "Economic Factors Affecting Milk Production Costs and Prices in Georgia," University of Georgia College of Agriculture Experiment Stations, Research Bulletin 155, April 1974.
- [3] Christ, Paul and Anna Schlenker. "Adjusting In-Area Sales Data for Calendar Composition," Federal Milk Order Market Statistics, AMS, U.S. Department of Agriculture, FMOS-158, February 1973, pp. 28-30 and FMOS-171, May 1974, pp. 31-34.
- [4] Dairymen, Inc. *Division News*, Georgia Division, July 1975.
- [5] Forker, Olan D. "Agricultural Prices in the 1970's: How Will Value Be Determined," *Southern Journal of Agricultural Economics*, Volume 6, Number 1, pp. 27-32, 1974.
- [6] Mayer, Leo V. "Experiences with Recent Price Stabilization Programs for Agriculture," *Southern Journal of Agricultural Economics*, Volume 6, Number 1, pp. 1-5, 1974.
- [7] Means, Gardiner C. "Simultaneous Inflation and Unemployment: A Challenge to Theory and Policy," *Challenge*, September-October 1975.
- [8] Riley, John B. and Leo V. Blakley. "Impact of Alternative Class I Pricing Systems on Fluid Milk Prices," *American Journal of Agricultural Economics*, Volume 57, pp. 67-73, 1975.
- [9] U.S. Department of Agriculture. "Milk Pricing Policy and Procedures: Part II Alternative Pricing Procedures," Report of the Milk Pricing Advisory Committee, March 1973.

