EXPLORING ALTERNATE PRICING SYSTEMS FOR FARMERS' MILK IN FLORIDA[1]

This topic involves some of the implications of changing from present price relationships and price discovery functions between butterfat and solids-not-fat (SNF) in milk pricing in Florida. It is timely because the pricing of components of filled and imitation milk, and the continuing interest in attaching more importance to SNF, currently attract dairy farmers as perhaps nothing else has in 15 years.

Three types of new products are of concern today. Those anticipated in 1922 by the Federal Filled Milk Act because they contain fresh or reconstituted skim milk as the protein base generally are known as filled milk. Two others -- one using sodium caseinate and the other using purely vegetable sources of protein -- probably are not subject to the Act and are generally known as imitation milk.

Experimental determination of the economic relationships involved seems of overriding importance, yet I know of no one doing research on the topic.

These foods are expected to compete with conventional whole milk in several ways. Non-price competition is likely as regards advertising, taste, color, nutritive values and consumer habits. Price, however, is likely to be the critically relevant form taken by competition. If these competitions develop, and if these foods are close economic substitutes for each other, fluid milk well may be hard pressed to maintain even most of the present market position it enjoys. On the other hand, if these foods are economic complements, the increase in the use of one will bring about an increase in uses of the others. If they are economic supplements, the change in any one will have no effect upon the others.

The case seems clearer that these filled products will be complements or supplements to present markets for nonfat dry milk (NFDM). Presumably, more SNF will be used in foods essentially new to the markets using NFDM.

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[1] Prepared and delivered by Dr. Ralph A. Eastwood, Economist, Marketing, Florida Agricultural Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, Florida at the Fifth Annual Dairy Production Conference, 2:30 - 3:00 P.M., May 7, 1968.

In the absence of experimental evidence, dairy farmers tend to draw upon their experience with margarine, mellorine, filled toppings and coffee whiteners. Their innate wisdom and reflexive instincts consider these new filled and imitation foods to be the newest acquisitions in this rogue's gallery.

For purposes here, we shall accept the prevalent point of view of farmers; even though the accuracy of this is in some doubt because much of the admittedly fragmentary market data generally quoted suggest that these foods are more complementary and supplementary to fluid milk than substitutes for it.

Our discussion will treat questions of costs and class equalization payments associated with filled and imitation milk; then, of component pricing of producer milk in general and with respect to milk solids in Florida milk, the present California pricing system for Class I, and flat pricing.

FILLED AND IMITATION MILK

Filled milk is sold in about one-fourth of the states and one-half of the federal order markets. The quantities generally are quite small compared with fluid milk, but they seem to grow.

The data from Oregon, California and Arizona are not adequate to support conclusions. They show parallel increases in sales of filled and whole milk. They show little, if any, substitution. If these data were dependable, this would be an excellent example of complementarity or supplementation, rather than substitution.

Filled milk sales equal a greater percentage of whole milk sales in Hawaii than in any other state. The opinions of at least some knowledgeable people there are that filled milks appear to be perhaps half substitutes and half complements or supplements to fluid whole milk. Again, they do not report scientific studies.

Imitation milk has appeared in small amounts in several markets. USDA reports that 15 handlers in 10 federal order markets sold an unknown amount in March 1968. There are at least three firms selling these products in Florida. The instinctive wisdom dairy farmers have applied to the problem in the absence of research proof has resulted in severe apprehension that in the long run these products may hold a serious -- even mortal -- threat to their enterprises. History probably will prove them right if the accounting is deferred for a great number of years.

Costs. Price competition between the foods we are considering will reflect the costs of producing them if the threats of substitution develop.[2] In-plant costs are not likely to be markedly different between the products. Raw material costs, in sharp contrast, may be expected to highly favor the competitors of whole milk. Present relationships per hundredweight synthesized for the Upper Florida Milk Marketing Area as of March 1968 would approximate:

Ingredient	Conventional Whole Milk	Filled Milk Made With: Class II Skimmilk	Filled Milk Made With: Reconstituted Grade A nonfat dry milk	Filled Milk Made With: Class I Skimmilk	Imitation milk
Fat[3]	$2.625	$0.700	$0.700	$0.700	$0.700
Solids-not-fat	4.175	2.311	2.335	4.175	1.575
Emulsifiers, sweeteners and stabilizers	none	none	none	none	1.075
Total cost before mixing	$6.80	$3.011	$3.035	$4.875	$3.350
Add: Mixing	none	.150	.150	.150	.150
Total cost ready for processing	$6.80	$3.161	$3.185	$5.025	$3.500
Total cost per half gallon ready for processing	$0.2924	$0.1359	$0.1370	$0.2161	$0.1505

Class equalization. If farmers were to choose, they probably would set class equalization payments at levels to bring the cost of filled milk to handlers at least up to that of fluid whole milk. Many observers say that the classified pricing system will be in jeopardy if skimmilk or SNF for use in filled milk ultimately are not priced to handlers at Class I prices.

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[2] The classified pricing system in use prices the milk used in the least price-elastic foods as Class I; the next least, as Class II; and on down to Classes III and IV. Relatively inelastic products have few substitutes; elastic, many. Therefore, substitution would be expected to be most effective in the lower priced classes first; in Class I, last. This theory is confirmed. Vegetable oils devastated butter, then made highly visible strides in frozen desserts, and liquid cream. In effect, the demand curve for dairy foods may be said to have become a skirmish line, with enemy breakthroughs in the price-elastic portions.

[3] This assumes 3.5% fat in all products. Obviously the fat content may be changed at will within legal limits.

A number of questions arise. Economics, law, equity, nutrition, and political sovereignty are not likely to yield the same answer to each.

Are class equalization payments lawful, especially as regards milk? Are these new products economic substitutes, complements or supplements? Should consumers be penalized by being prevented from benefits possible from the drying of milk in the Dairy Belt, transporting NFDM to a handler in the consumer market, and his reconstituti the fluid there? Should the class equalization payment be made to the market of origin of the skimmilk or NFDM; or should it be made to the market where the filled milk is sold? Should producers ultimately receive the payments? If so, those in which market? If not, who should Should the producers of manufacturing milk be qualified as regular suppliers of the market in which reconstituted filled milk is sold? What enforcement problems arise as a consequence of each answer?

Other questions are relevant. Should producer-handlers be regula If so, how? Will any new plan drive handlers away from filled milk, t imitation milk? If so, how serious is this? How soon are these produ a threat serious in dollars and cents, rather than as a working hypoth

Our review of the costs of producing raw materials for these foods suggest that the following class equalization payments might be necessa to assure conventional whole milk price parity with filled and imitatio milks in the Upper Florida Milk Marketing Area as of March, 1968:

Product	Class Equalization Payment $/cwt.
Filled milk made from:	
Class II skimmilk	3.639
Reconstituted Grade A NFDM	3.615
Class I skimmilk	1.775
Imitation Milk	3.300

COMPONENT PRICING

Dairy farmers and milk handlers often consider new relationships f possible use in the pricing of butterfat and SNF. This usually is in response to the traditional expressions by nutritionists that butterfat does not deserve the prominence it has in the present arrangements for milk price discovery. Protein is a glamour item in the dietary. Other components are less so.

Milk Solids. A Florida dairy farmer wishing to calculate the effects of various component pricing systems upon his milk check may be interested that members of the Department of Dairy Science at the University of Florida think the Jacobson Relation would be found generally valid for Florida.

It holds that SNF in the milk supply generally equals 7.07 + 0.40 multiplied by the butterfat content. For example:

Fat	SNF	Fat	SNF
%	%	%	%
0	7.07	4.5	8.87
1.0	7.47	4.6	8.91
2.0	7.87	4.7	8.95
3.0	8.27	4.8	8.99
3.1	8.31	4.9	9.03
3.2	8.35	5.0	9.07
3.3	8.39	5.1	9.11
3.4	8.43	5.2	9.15
3.5	8.47	5.3	9.19
3.6	8.51	5.4	9.23
3.7	8.55	5.5	9.27
3.8	8.59	5.6	9.31
3.9	8.63	5.7	9.35
4.0	8.67	5.8	9.39
4.1	8.71	5.9	9.43
4.2	8.75	6.0	9.47
4.3	8.79	6.1	9.51
4.4	8.83	6.2	9.55

California system. California is thought to be the largest milk market in the world using prices of butterfat, SNF and fluid to discover Class I producer prices.[4]

The Jack Formula is used there for the average relationships of butterfat and SNF. It is 7.07 plus 0.444 multiplied by the butterfat content.

The California hearing procedure determines the value of each of the three components of Class I milk in each marketing area. SNF is priced at whilesale market value. Fluid components are priced at the approximate transportation cost. The residual of the necessary price is allocated to 3.5 pounds of butterfat per hundredweight of milk. For example, the computation for the Calaveras-Tuolumne market as of February 1, 1968 was:

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[4]Class I prices in California are subject to hearing testimony before they are changed. Prices of Class II and Class III there fluctuate with market values of butterfat and SNF.

Component	Base Test x	Price per pound =	Milk Value
	%	$	$/cwt.
Milk fat	3.5	.91	3.185
SNF	8.622	.26	2.242
Fluid	87.878	.0046	0.400
Total	100.000	XXXXX	5.827 or 5.83

Individual producers in that market received the Class I price of $5.83 if their milk tested 3.5% butterfat and 8.622% SNF. Otherwise, producer received a price differing from this depending upon the tests his milk.

Things of special interest in such a pricing plan include:

1. Consumers prize a pound of butterfat much more highly than a pound of SNF and will pay accordingly, even though nutritionists may question the wisdom of the choice.

2. Prices of SNF may be used as a measure of protein values because tests for SNF are much quicker and cheaper than those for protein, and SNF and protein vary almost exactly directly with each other in milk at the time of its secretion.

3. Emphasis could be reduced on butterfat[5] and increased on SNF. This is consistent with the philosophy that supplies of low butterfat will best serve the nutritional needs of consumers, and maximize the consumer satisfactions from a given amount of farm resources available for dairy production.

4. Use of constant pricing differentials for butterfat and SNF increases the net differentials for milk testing relatively high in butterfat. This may not be enough to offset relative dairy merit of cattle.

5. Pricing on total solids is equitable, but it does not inherently discriminate between the values of a pound of butterfat and a pound of SNF as do consumers.

6. Increasing the price of SNF almost surely will result in greater federal procurement of SNF if all are sold.

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[5]In the California case, butterfat is emphasized more than it is in other markets.

7. Reduction of butter prices may not reduce federal purchases of butter. Reductions on the order of 15 cents per pound may be necessary to clear the market without government price support purchases.

8. Reduction of butterfat prices almost certainly will lower aggregate dairy farm income unless subsidies are increased to offset the commercial sales losses.

9. This system as practiced in California is not expected to generate publicity favorable to increasing milk consumption.

10. Allowing butterfat (or SNF, or fluid) to carry the residual values results in unrealistically high values for it.

11. Price discovery may be too complicated for easy explanation or understanding.

12. This problem has two sides -- collection from handlers and payment to farmers. The California procedure deals only with payments to farmers.

13. Costs of testing, preparing payrolls, and other administration may surprise many who contemplate such a procedure.

14. There is a price incentive -- however slight as practiced -- for production of milk of higher SNF content. This incentive could be changed.

15. Extensive experience is accumulated concerning the testing for SNF and the relationships between the solids components in the California milk supply.

Flat pricing. There is tremendous interest in whether to go back to the flat pricing system used before the advent of classified pricing. Under this plan, handlers would be charged for the pounds of milk they buy regardless of content of butterfat, solids-not-fat and fluid. The corollary problem is how to pay farmers if handlers are charged a flat price. These are two significantly different goals and can be reconciled by repooling if farmers are to be paid according to tests, location differentials, and the like.

Such a plan might reduce butterfat surpluses if more fat is consumed as a beverage. This would tend to improve prices of manufacturing milk for butter and cheese because less fat from a given milk supply would go to those uses. If successful, it would thus change the trends toward lower-fat drinks and probably would meet protests from nutritionists.

The plan would price butterfat and SNF at the Class I price of milk. That is about 6.8 cents per pound. Such a new price structure would encourage standardization to produce exceedingly cheap solids f Class II and III uses. Classification enforcement under those circum stances would be an interesting procedure to observe.

Fluid skim sales would be hurt. In Florida federal order market these totalled 10,081,406 pounds, or 8.1 percent of Class I sales, in March 1968.

It would reduce the competitive advantage of filled milk to the extent that a pound of butterfat would be worth only the value of a pound of milk, whereas vegetable oil would be worth perhaps 20 cents pound on a comparable present basis. This would not reduce the valu milk, however, because the other component values presumably would k the total value of whole milk at present levels.

It would seem to encourage the pricing of all butterfat at lowe prices than prevail now, because of the question as to whether butte in Class I should be priced differently than that in manufacturing c

It pays nothing for the additional food energy in milk testing some minimum. This would tend to encourage the lowering of minimum Depending upon the repooling system, this could be expected ultimate return more price advantage to milk testing below the basic fat test less to milk of high fat test.

CONCLUSIONS

There are things farmers can do as individuals; and many they c can do as groups. Some of each type seem appropriate.

Individual Actions

1. Many dairy farm problems are more urgent and have greater magnitudes for Florida dairy farmers. Excellent economic health will pay off whether the present threat develops or

2. Expand support to organizations primarily concerned with mi marketing.

Group Actions

1. Research the question of the degree to which these new food are substitutes, complements or supplements to conventional milk and dairy foods.

2. Guard against jeopardizing sales of Class I skimmilk by pri discovery methods intended to hamper emerging products whic are hardly beyond the threat stage.

3. Reduced butterfat differentials for manufacturing milk will reduce total dairy farm income unless the government sector will increase the dairy subsidy an offsetting amount.

4. Study price experimentation in other markets. Schedule hearings when needs are clearly present.

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