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UNDERSTANDING YOUR MILK CHECK

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Recent changes caused by federal milk marketing order reform have resulted in new pricing incentives and big changes to farmers' milk checks.¹ Producers shipping milk into federal orders that use multiple component pricing (MCP) are now paid on the basis of milk components: butterfat, protein, and other solids. Some farmers are also getting milk quality premiums in the form of Somatic Cell Count (SCC) adjustments. This new method of milk pricing differs from the old system, which in most federal orders paid farmers one price for their milk, with adjustments for butterfat level only.

Many dairy producers complain that the new milk pricing system is too complicated, and many do not understand how the various parts of their milk check are derived. Yet most of the information needed to understand the new milk check is now available over the Internet. In addition, many dairy producers don't yet appreciate the importance of milk components in determining their bottom line. Dairy producers who produce above-average levels of milk components will receive above-average milk checks. Unfortunately, the reverse is also true; those who produce below-average milk component levels will receive below-average milk prices.

The purpose of this report is to explain how milk pricing has changed under federal order reform. Emphasis will be placed on helping dairy producers understand the various parts of their milk check and how the new prices are determined. Dairy producers who understand the new pricing system and the significance of milk components and quality will have an economic advantage over those who do not.

1. For a detailed explanation of federal order reform, see *How Milk is Priced in Pennsylvania Under Federal Order Reform*, available from Penn State's Department of Agricultural Economics and Rural Sociology. This information also is available on the Web at <http://www.aers.psu.edu/dairyoutlook/>

BACKGROUND: FEDERAL ORDER REFORM

For many years, it has been understood that some type of change in milk pricing at the national level was needed. This is because the basis of milk pricing before federal order reform, the Basic Formula Price (BFP), was no longer statistically feasible. In other words, it was no longer accurate in setting national milk prices because it was based on a very limited survey of unregulated milk (Grade B milk) in the Upper Midwest. Although most of the unregulated milk in the U.S. was located in the Upper Midwest, this supply represented less than 4 percent of all U.S. milk production. Change was needed.

Congress called for this change in the 1996 Farm Bill. It authorized the Secretary of Agriculture to consolidate the number of milk marketing orders to between 10 and 14, replace the BFP, and come up with a new plan for setting Class I fluid milk prices across the United States. The Secretary's "Final Rule" called for 11 federal orders, new formulas for class prices, and a new system of determining fluid milk prices.

The most controversial part of this proposal was the new method of setting fluid milk prices (Class I prices). Class I prices are equal to the Class I mover plus a differential. The Class I mover is determined each month by the USDA for all federal orders. The Class I differential, which represents differences in transportation costs from surplus to deficient regions, varies from county to county, but does not vary from month to month once it is set. Initially the Secretary suggested two choices for Class I differentials: Option 1A and Option 1B. Option 1A was more similar to existing differentials, while Option 1B was considered more "market oriented." In the Final Rule, the Secretary chose to use Option 1B, which became very controversial.

In fact, a federal injunction was issued on September 29, 1999 because of the Secretary's choice. The

injunction effectively prevented federal order reform from taking place. As a result, Congress got involved and passed the Consolidated Appropriations Act of 2000. That act replaced the Secretary's plan for Class I differentials with a modified Option 1A plan. Congress also set aside the federal injunction, allowing federal order reform to take place. Those changes were implemented January 1, 2000.

The point of this discussion is to inform dairy producers that the Class I differentials implemented in each county of the U.S. as of January 1, 2000 were very carefully studied, debated, and ultimately selected by the Congress. These levels have significance to dairy producers because they are used to "adjust" pay prices on the milk check. They will be discussed below in the section entitled "Location Adjustment."

COMPONENT LEVELS

In addition to water, milk consists of three major components: butterfat, protein, and other solids (mainly lactose and minerals). Manufacturers use these components when they make cheese, butter, and other dairy products. Therefore, it makes sense to pay dairy producers on the basis of these components.

The Northeast order 1 and the Mideast order 33 now use multiple component pricing, or MCP.² Under this pricing method, dairy producers have their milk tested to determine the pounds of butterfat, protein, and other solids it contains. The new milk checks pay dairy farmers for each pound of components they produce and ship. These are reported each month on the milk check, along with the component prices.

This new method of milk pricing is illustrated in the example provided in Table 1. Our example producer lives in Pennsylvania and ships milk to

2. Before January 1, 2000, federal orders 33 and 36 used a multiple component pricing system that priced butterfat and protein only.

the Mideast federal order 33. This producer shipped 113,448 pounds of milk during the month of April 2000 (line A). The milk was tested, and the results indicated that our producer shipped 4,311 pounds of butterfat, 3,517 pounds of protein, and 6,580 pounds of other solids. The component levels calculated as percentages of milk shipped were 3.80 percent butterfat, 3.10 percent protein, and 5.80 percent other solids (lines B–D).

COMPONENT PRICES

Also appearing on the new milk check are the individual component prices. For April 2000 (on a per-pound basis), these were \$1.1352 for butterfat, \$1.7399 for protein, and \$0.0408 for other solids. Our example producer was paid these prices for the pounds of components shipped, and therefore received \$4,894 for butterfat, \$6,119 for protein, and \$268 for other solids.

Under component pricing, dairy farmers should focus on the pounds of these components that end up in the milk tank each day! *The more components produced in each 100 pounds of milk, the more money a dairy producer is paid!* Likewise, the lower the compo-

nent levels in 100 pounds of milk, the less money a dairy producer is paid (on a hundredweight basis).³

The prices for these components are calculated each month for all federal orders using component formulas and dairy commodity prices. These formulas recognize that the value of dairy components such as butterfat, protein, and other solids should be linked to the market value of dairy commodities such as butter, cheese, nonfat dry milk, and whey.⁴ *Thus, as the prices of dairy commodities increase, component values go up. The opposite is also true.*

The National Agricultural Statistics Service (NASS) calculates monthly average prices for butter, cheese, nonfat dry milk, and whey. These prices are calculated on the basis of a national survey of plants that produce these commodities. To obtain the component values, the survey prices are applied to an economic formula that takes into consideration the cost of converting milk into dairy components and the amount of components in the dairy commodity. Given a price for butter, this formula converts the market value of butter into a component value for butterfat.

Table 1. Sample milk check for farm in western Pennsylvania, Federal order 33, for milk shipped during April 2000.

Check No. 437876		Check Date: 05/26/2000			
	Lbs	Rate	Price	Desc	Total
(A) Grade A pounds	113,448			lbs.	
(B) Grade A butterfat	4,311	3.80	1.1352	lbs.	4,893.87
(C) Grade A protein	3,517	3.10	1.7399	lbs.	6,119.03
(D) Grade A other solids	6,580	5.80	0.0408	lbs.	268.46
(E) Total component value			9.94	\$/cwt	11,281.37
(F) Producer Price Differential ¹			2.46	\$/cwt	2,790.82
(G) Volume premium			0.00	\$/cwt	0.00
(H) SCC (thousands) ²	400		-0.03	\$/cwt	-34.03
(I) Over-order premium			0.25	\$/cwt	283.62
Gross amount			12.62	\$/cwt	14,321.77
(J) Deductions:					
Hauling			0.45	\$/cwt	510.52
Milk promotion—federal			0.15	\$/cwt	170.17
Coop/marketing fees			0.18	\$/cwt	201.08
Mid-month advance			9.54	\$/cwt	5,411.47
Total deductions					6,293.23
Net mailbox pay price ³			11.85	\$/cwt	13,440.01
Net payment on milk check ⁴					8,028.54

1. The PPD in Cleveland was \$2.36; the adjustment to Sharpsville, Pennsylvania, was \$0.10.

2. Equal to 350 times SCC level (in thousands) times the SCC rate adjustment.

3. Gross amount minus deductions not including the mid-month advance.

4. Gross amount minus all deductions.

3. It should be noted that there is an economic trade-off between milk volume and component levels measured in percentage terms. Are you better off producing more milk per cow at standard component levels, or maintaining milk per cow but increasing component levels? Dairy producers should examine the economics of this trade-off.

4. Note that butter and butterfat are not the same. Butter is a dairy commodity, and butterfat is a pure milk component. Butter contains butterfat as well as moisture and other solids. The component formula for butterfat, however, recognizes that the value of this component should be linked to the market value of butter.

TOTAL COMPONENT VALUE

Under the old system, dairy producers could look to the announced Basic Formula Price, or BFP, to know whether their milk check was going to go up or down. That's because three out of four class prices in federal orders were tied directly to the BFP. Today, dairy producers hear announcements of advanced skim and butterfat prices and monthly average component and class prices. Then they look at their milk check and have a hard time relating all of this information to their bottom line (i.e., "What did I receive for my milk this month and why?").

One major price dairy producers should be aware of is the Class III value of their components (Table 1, line E). We'll call this the "total component value." It is unique to each producer, since it is based on component levels that vary from farm to farm. It also reflects a basic building block of farm income, since it is equal to about 80–90 percent of the gross milk price (before deductions) on most milk checks in the Northeast. Unfortunately, the total component value (in dollars per hundredweight) is not presented on most milk checks. It can be calculated easily, as follows:

Total component value = (% butterfat x butterfat price + % protein x protein price + % other solids x other solids price)

The total component value in effect represents a dairy producer's very own BFP. What's unique about this price, however, is that it is partly under the control of dairy producers. That's because dairy producers can change this value in a given month by managing their component levels. In other words, good management can result in increased protein and butterfat levels, resulting in higher total component values. In the short term, dairy producers can improve component levels through changes in the feeding program. In the long term, a breed-

ing program must be used to improve component levels.

The total component value should be calculated each month and then compared to the average total component value for the federal order to which milk is shipped. The averages for orders 1 and 33 are not published by the Market Administrators. Rather, they must be calculated, using the formula above, based on average component levels in these orders for a particular month. These figures are obtainable from the Internet at <http://www.fmmone.com/> for Northeast order 1 and <http://home.sprynet.com/~clevelandmal/mahmepge.htm> for Mideast order 33. Dairy producers may find their individual total component value

above or below this average price for the order. For more information on performing this calculation, see the Penn State Cooperative Extension publication, *Milk Components and Quality: New Methods for Paying Pennsylvania Dairy Farmers*.

Note that dairy producers should *not* compare their total component value to the *announced* Class III price for all federal orders. That's because the announced Class III price is simply a statistical price that uses standard component levels (i.e. 3.5 percent butterfat, 2.99 percent protein, and 5.69 percent other solids). It reflects actual component *prices* for the month, but does not reflect actual average component *levels*. Dairy farmers are paid on the actual level of their milk components.

Table 2. Comparison of component levels and total component value to the order average.

	<i>Sample Farm</i>	<i>Order Average</i>	<i>Change</i>
Month: April			
Year: 2000			
Federal Order: Mideast Order 33			
Hundredweights of milk shipped	1,134		
Component levels (lbs)			
butterfat	4,311		
protein	3,517		
other solids	6,580		
Component prices (\$/lb)			
butterfat	1.1352	1.1352	
protein	1.7399	1.7399	
other solids	0.0408	0.0408	
Component levels (%)			
butterfat	3.80	3.73	0.07
protein	3.10	3.04	0.06
other solids	5.80	5.70	0.10
Total component value	\$9.94/cwt	\$9.76/cwt	\$0.18/cwt
Gross farm price:			
Net PPD	2.46		
Over-order premiums	0.25		
Volume premiums	0		
Quality premiums	-0.03		
Total gross farm price	\$12.62/cwt		
Deductions: ¹			
Hauling	0.45		
Milk promotion—federal	0.15		
Coop/marketing fees	0.18		
Total deductions	0.78		
Net mailbox pay price	11.84		

1. Compute these by dividing deductions by the cwts of milk shipped.

An example of a comparison between a dairy producer and the market average is provided in Table 2. The example dairy producer is compared to the average component levels for all dairy producers in federal order 33 for April 2000. The results show that the example farm produced more milk components on a percentage basis than the order average. Our example dairy producer had a total component value of \$9.94 per cwt, 18 cents per cwt higher than the order average price of \$9.76 per cwt. *Having above-average component levels translates into an above-average milk price!*

PRODUCER PRICE DIFFERENTIALS

It was stated earlier that the total component value represents about 80–90 percent of the gross milk price for most dairy producers in the Northeast. Another major factor in the gross milk price is the Producer Price Differential, or PPD (Table 1, line F). The PPD for our example dairy producer was \$2.46 per cwt. The PPD, while not under the control of dairy producers like the total component value, is a significant part of the gross value of milk.

What Is the PPD and How Is It Calculated?

The PPD is the value of the milk, above and beyond the Class III value, derived via the federal order system from the marketplace. In effect, it is the economic benefit of the federal order system of classified pricing.

To understand the PPD, let's start with the federal order pool. Market Administrators require milk buyers to pay minimum prices for milk according to its use. Class I milk has the highest value, and Class III and IV the lowest value. In April 2000, the Mideast order had a minimum Class I value (in Cleveland) of \$12.93 for milk used for fluid purposes, a Class II price of \$12.10 for milk used to make soft products like yogurt and ice cream, a Class III price of \$9.41 for milk used to make cheese, and a Class

IV price of \$11.38 for milk used to make butter and nonfat dry milk.

A grand total of 1.1 billion pounds of milk was used in order 33 during April 2000 at a pool value of \$26.1 million. Dividing the dollar value of sales by the pounds of milk used calculates the uniform statistical price, which was \$11.77 per cwt at standard component levels. The question then becomes, "How does the Market Administrator pay this price back to participating producers?"

The answer is in two payments: one for the class III value of milk, and the second for the remaining value of milk in the pool (the PPD). The PPD is the remaining dollars after removing the Class III value of components from the \$26.1 million dollar pool. For example, the PPD for Mideast order 33 in April was \$2.36 per cwt. It was calculated by deducting the announced Class III price of \$9.41 from the uniform price of \$11.77. Again, these prices are calculated at standard component levels.

Location Adjustment

Each month, a Market Administrator announces the PPD in each federal order that uses multiple component pricing. It is announced at the base zone for the relevant order. For example, the Mideast order PPD for April 2000 was announced for Cleveland, Ohio, at \$2.36 per cwt.

Since fluid milk prices are subject to the map of Class I differentials agreed upon by the Congress, the PPD is adjusted from the announced zone to the local plant to which a producer's milk is shipped. Thus, for example, fluid milk sales in Lancaster are priced lower than similar sales in Boston because of the map. So the PPD in Lancaster must reflect this difference in fluid milk pricing.

This adjustment, applied to the base zone PPD, is often a negative number. *The question most often asked is, "Why are they taking money out of my milk check?"* The answer is that money is not being taken out of your milk check. In theory, instead of calculating the PPD for the highest-priced zone in each order and adjusting

prices down from there, the Market Administrator could calculate the PPD for the *lowest-priced* zone, and then adjust everyone's price *up*. This adjustment would appear as a positive number on the milk check, but either way, the amount of money in the federal order pool and the amount of money each dairy producer receives each month would remain the same. So let's explain how location adjustments are calculated in more detail.

Class I Differentials

The Secretary of Agriculture developed two plans for Class I differentials (Option 1A and 1B). The Secretary chose one (Option 1B), but Congress later overturned this option and mandated Option 1A. Under Option 1A, Class I differentials generally increase from west to east and from north to south relative to the Upper Midwest region. Prices are set on a county-by-county basis.

These "differentials" (not to be confused with the PPDs themselves) are used to adjust the Class I price of milk throughout the country. The PPD is calculated and announced for the base city in a federal order and is then "adjusted" to each of the plants located throughout the order. *These adjustments to the PPD are equal to the relative differences in the Class I differentials between the base city and the county in which the milk plant is located.*

For example, the Class I differential for Boston is \$3.25 per cwt and the Class I differential in Lancaster, Pennsylvania is \$2.90. Thus, the location adjustment for Lancaster (which will be applied to the PPD) is $-\$0.35$ per cwt ($\$2.90 - \3.25). The announced PPD for the Northeast federal order in April 2000 relative to Boston was \$3.05. Thus the PPD, in Lancaster, Pennsylvania was \$2.70 ($\$3.05 - \0.35). The Boston PPD is adjusted to Lancaster using $-\$0.35$, the difference between the Class I differentials. Dairy farmers shipping to plants (fluid and manufacturing) in Lancaster will use this same adjustment each month to calculate the Lancaster PPD.

In another example, the Class I differential for Cleveland is \$2.00 per cwt and the Class I differential in Sharpsville, Pennsylvania is \$2.10. Thus the location adjustment for Sharpsville is \$0.10 (\$2.10 – \$2.00). The announced April 2000 PPD for the Mideast order 33 in Cleveland was \$2.36 per cwt. Thus the PPD in Sharpsville, Pennsylvania was \$2.46 per cwt (\$2.36 + \$0.10). Dairy farmers shipping to plants in Sharpsville will adjust the announced Cleveland PPD by \$0.10 per cwt every month.

If you are interested in learning more about your location adjustment, contact your milk handler or go to the following Web sites:

Mideast federal order 33: <http://home.sprynet.com/~clevelandmal/mahmepge.htm>

Northeast federal order 1: <http://www.fmmone.com/>

PREMIUMS

In addition to the total component value and the PPD adjusted to your location, farmers may also receive premiums on their milk checks that increase the gross value of milk.

These include over-order premiums, quality premiums, and volume premiums (Table 1, lines G–I)

Over-order premiums are payments in excess of federal order minimum prices. Usually these are collected on Class I fluid sales. In some cases, they are negotiated by dairy cooperatives. In other cases, they are determined by the powers of the state.

In Pennsylvania, fluid milk produced, processed, and sold in the state is often subject to an over-order premium. Those premiums are then pooled by the individual buyers of milk on a plant-by-plant basis and are paid back to the Pennsylvania producers that supply these plants. Thus, Pennsylvania dairy producers shipping to a bottling plant may receive 90 percent of the announced premium, whereas dairy producers shipping to a manufacturing plant may receive 30 percent of the announced premium.

In New England, participating dairy producers receive an over-order premium from the Northeast Interstate Dairy Compact.

Quality premiums may be paid on milk produced in the Northeast to encourage producers to supply high-quality milk to the marketplace. A form of quality premium based solely on Somatic Cell Count is incorporated in the Mideast order 33. Outside of this order, programs for quality premiums are dependent on the individual milk buyer and are designed to encourage production of high-quality milk.

As their name implies, *volume premiums* reward producers who ship large amounts of milk each month. These premiums are designed to reflect the fact that it is cheaper, on a per-cwt basis, for a milk handler to pick up milk from a large farm than from smaller farms. These premiums also may be designed to encourage producers to expand their operations so they can ship tankerloads of milk (over 50,000 pounds per pickup).

MILK CHECK DEDUCTIONS

There are four major deductions from the milk check each month (Table 1, line J). They are: hauling, federal advertisement/promotion, cooperative/marketing fees, and the half-month advance payment.

The half-month deduction, otherwise known as the advance, is a partial payment on the first 15 days of milk shipments. It is valued at the lowest class price from the previous month. In the example provided in Table 1 for an April milk check, the advance payment is equal to half of the milk shipment for the month multiplied by the March 2000 Class III price of \$9.54 per cwt.

Hauling rates can be calculated by dividing the total hauling bill on the milk check by the pounds of milk shipped (in cwt). The hauling bill may consist of a variable rate per cwt of milk hauled plus a fixed stop charge. Hauling rates are negotiable

between the producer (or the cooperative) and the hauler.

Because of federal order reform, hauling charges have changed significantly for dairy producers who used to ship milk to the old New York/New Jersey federal order 2. Under the previous system, which was called “farm point pricing,” most of the cost of hauling milk was deducted from the federal order pool each month before the uniform price was calculated. Thus, even though producers paid the full cost of hauling, their milk check made it seem that their hauling bill was modest. Under federal order reform, hauling costs could no longer be deducted from the pool in the Northeast federal order. As a result, effective January 1, 2000, milk checks for the Northeast order reflected the full cost of hauling.

Some producers may notice that their hauling bill, measured in dollars per cwt, may be higher than their neighbors’ in certain months. Upon closer inspection, however, they may also notice that their PPD is higher. Remember, the PPD is paid at the plant location; so some dairy producers shipping to fluid plants in distant markets may have a higher PPD, which usually will be offset by higher hauling costs.

Other marketing fees on the milk check might be associated with the milk buyer. For dairy producers who market milk through a cooperative, there may be deductions for capital retains and administrative expenses. For dairy producers shipping milk as nonmembers, there may be market service fees. To arrive at a per-cwt cost, take the cost of these fees listed on the milk check and divide them by the cwt of milk shipped.

A final deduction on all milk checks is for federally mandated advertising and promotion programs. This is \$0.15 per cwt.

WHICH PARTS OF THE MILK CHECK ARE UNDER YOUR CONTROL?

It is important that dairy producers understand which parts of the milk check are under their control, and which are not. For example, most dairy producers cannot affect the component values, PPD, location to which their milk is shipped, hauling rate, federal advertising rates, and other deductions. Dairy producers can, however, control the following:

- volume of milk shipped
- component levels
- milk quality

Dairy producers should use their milk check to monitor their performance each month. Producers are, in effect, competing with other dairy producers in the order to which they ship milk each month. If one dairy producer is receiving \$1 per cwt more for milk than his neighbor because of better milk components and quality, that producer will be more successful in the dairy industry of the future. Federal order reform has ushered in a new level of competitiveness in the milk business.

Thus, dairy producers should renew their focus on management efforts they can control. Efforts to improve milk component levels would be economically advantageous. Producers should focus on breeding, sire selection, feeding practices, and feed quality to improve component levels and profitability. Some changes have short-term effects, others have long-term effects. For more information on managing herds to improve component levels, see the Penn State Cooperative Extension publication *Milk Components and Quality: New Methods for Paying Pennsylvania Dairy Farmers*.

Dairy producers could use the example in Table 2 to set goals for milk volume, component levels, and milk quality. Doing so can help them monitor economic performance each month. Adjusting the level of milk components and quality could have a significant positive effect on monthly cash receipts.

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