



Milk Volume or Component Test?

With lower milk prices expected for 2020, where should farms focus?

Dairy business consultants are often asked two questions:

- 1) With components being most of the pay price and the high cost of trucking and marketing milk, should I be focusing more on component test and less on volume?
- 2) We are good at enhancing butterfat and protein test through manipulating the lysine to methionine ratios in the diets, but does it pay to do so when milk prices are low? Both are very good questions that deserve looking into.

Let's start by studying how producers are currently being paid for milk. 2019 was unpredictable in terms of farm paychecks. Dairy producers experienced large swings in component pay prices, very drastic changes in Producer Price Differential (PPD) pay prices, and continued higher shipping and marketing expenses.

“...farms experienced large swings in component pay prices [and] drastic changes in PPD.”

Milk Check	Dollar/cwt.	% of Milk Check	Range in pay price \$/lb.
Butterfat	9.75	51%	\$2.19-\$2.69
Protein	7.46	39%	\$1.17-\$3.91
ONFS	1.07	5.5%	\$.11-\$.29
PPD	0.35	1.8%	\$1.80 – (\$2.00)
Premiums	0.52	2.7%	
Total	19.15	100%	

Figure 1: 2019 Milk Check Breakdown

2019 was a record-breaking year in that component income was 95.5% of the average farm's pay price. Much of the story in 2019 was in the wide range for protein and PPD pay prices. Protein pay price averaged \$2.38/lb. but the range was very wide. A one-point improvement in protein test would result in a higher milk price that ranged from \$0.12 per hundred weight (cwt.) early in the year, to a whopping \$0.39/cwt. late in the year — a large difference in revenue.

Butterfat pay price averaged \$2.50/lb. in 2019. This spread was tighter and ranged from \$2.19-\$2.69/lb. A one-point improvement in herd butterfat test resulted in a \$0.22-\$0.27 higher milk price.



Premiums paid averaged \$0.52/cwt. for the year. At one time, premiums averaged well over \$1.00/cwt. That goes to show how much erosion in premiums the Northeast market has experienced since 2014. PPD pay prices averaged \$0.35/cwt. in 2019, but the bigger issue was the variation in PPD pay prices during the year. PPD ranged from \$1.80/cwt. in the beginning of the year to almost (-\$2.00)/cwt. in the fall.

On the expense side of the milk check, it was also a record-breaking year for trucking expenses, balancing fees and marketing costs in the Northeast. They averaged \$1.22/cwt. Note that this was higher than PPD and premiums combined.

Looking ahead to 2020, despite a \$0.60/cwt. lower milk price, some of the same variability in component and PPD prices is expected, but there will be one big change in your farm's paycheck: *Protein will overtake butterfat in terms of the top income source.* Based on current 2020 forecasts, butterfat is expected to average \$1.87/lb. while protein is expected to average \$3.55/lb.

If most of the milk pay price is from components, should we focus more on test and less on milk volume?

Producers may assume that with components being 95% of milk income that shipping extra water is not a benefit, but it is necessary to follow the income over feed cost (IOFC) formula to answer that question. The problem with thinking that milk volume is not important is that milk volume is the carrier of the components and is linked in the pay price formula.

Every additional pound of milk a cow makes comes with butterfat, protein and other non-fat solids (ONFS) income, along with premiums and PPD. Generally, the trucking and marketing costs negate the PPD and premiums income. In 2019, that net income (after marketing and trucking) amounted to \$0.18/lb. for each additional pound of milk. Therefore, milk volume cannot be ignored.

Producers also shouldn't ignore component test because that is how to maximize component pounds shipped. However, it is important to get a return on the money spent to enhance component test — especially when component prices are lower. When farms enhance butterfat or protein test, a higher pay price is realized for milk. The amount of increase depends on the pay prices for butterfat and protein.

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For example: If the herd is making 80 pounds per day, and the herd's butterfat is enhanced one point and the butterfat pay price is \$2.00/lb., each point of fat test enhancement adds \$0.20/cwt. to the milk price. For a herd averaging 80 pounds per cow, that would increase revenue per cow \$0.20 x (80/100) or \$0.16 per cow per day. Then, it is necessary to spend less than \$0.16 per cow per day to enhance the test in order to get a strong return on investment.

An ideal return on investment (ROI) target for component additives is 100%. Example: Spending \$0.10 per cow to receive \$0.20 per cow or more in milk revenue. Essentially doubling the money invested equals 100% ROI, but the farmer will accept a minimum of 50% ROI (spend \$0.10 per cow but get back \$0.15 per cow).

A strong return is needed on inputs like this because of the many biological and operational factors impacting a dairy farm. One example is that there can be a week or two lag time between investing in a ration change involving components and seeing the result. That is a source of shrink that needs to be figured into the ROI. Another issue is the effect of summer heat on component performance. Most of the summer we don't see the same kind of response that we see in fall through spring on component additives. The other potential issue is shrink and loss that can happen on farms with feed and feed ingredients. The feed additive that costs \$0.10 per cow can quickly become \$0.11 per cow when there is spillage, refusals and/or storage losses.

The point is that farms can't afford to be spending \$0.20 per cow in ration additives and get back \$0.20 per cow. This may look like breakeven economics, but with so many biological and operational factors, it is really a loss. It is necessary to keep purchased feed cost per pound of component as low as possible without sacrificing milk volume.

Below is a new measure to track purchased feed cost per pound of component. A good goal based on 2019 benchmarks is equal to or less than \$0.88/lb. of component.

$$\frac{\text{Feed Cost per Cow per Day}}{\text{Pounds of Fat and Protein combined}}$$

$$= \frac{\$5.50}{6 \text{ lbs}} = \$0.92$$

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Figure 2 provides a milk revenue calculator spreadsheet that allows you to plug in current milk check pay prices and marketing expenses to quantify the impact that a potential change in milk produced or fat and protein test could have on your farm's milk revenue per cow per day.

By changing the milk pounds and/or butterfat or protein test up or down, the spreadsheet can be used to model the impact a ration change may have on milk revenue per cow per day. This spreadsheet shows the importance of milk volume for maintaining milk revenue and the relationship between milk and protein test to milk volume. Using 2019 pay prices, producers

Milk Revenue Calculator				
Farm Name:	Sample Farm, LLC			
Enter data in yellow fields to run various scenarios				
Scenario 1:	Current performance			
Milk lbs./cow/day			80.00	
Butterfat test			3.80%	
Protein test			3.05%	
ONFS test			5.70%	
	Value Per lb.	Per CWT	Lbs.	Revenue per cow/ day
Fat	\$2.00		3.04	\$6.08
Protein	\$2.80		2.44	\$6.83
ONFS	\$0.18		4.56	\$0.82
PPD and Premiums	\$0.01	\$0.92		\$0.74
Hauling and Marketing	\$(0.01)	\$1.22		\$(0.98)
Revenue per cow per day (Scenario 1)				\$13.49

Figure 2: Mark Mapstone - Milk Revenue Calculator

could potentially gain one point of butterfat or protein and lose one pound of milk and still maintain the same milk revenue per cow per day. Alternatively, gaining one pound of milk and losing one point of fat or protein (not both) keeps the milk revenue level. Note: if there is any additional feed cost to this scenario, you have gone backwards in IOFC. If there is a feed savings, IOFC has improved.

Looking to 2020: When component prices are low, should my feeding strategy change?

Milk price is based on the underlying values of the components paid for. The basic concept is when component values rise, so does milk price. Subsequently, when milk price is dropping (like it has in 2020), so are the underlying component pay prices. When component prices are lower, the potential ROI is much lower.

Butterfat: According to nutritionists, when butterfat is above \$2.00/lb., it's likely to get a return on feeding palm fats to enhance butterfat test. When butterfat pay price is at \$2.50/lb., it's very likely to show a good return on feeding palm fats. Be careful with butterfat additive costs this year in order to get a good ROI. Note that butterfat price is expected to dip below \$2.00/lb. many months during the year and was under the \$1.40/lb. range in April and May.

Protein: According to nutritionists, protein additives can be more costly to the ration (bypass protein is more costly than rumen degradable sources, so it tends to add more overall cost to the ration), and it takes a minimum protein pay price of \$2.50/lb. or more for the protein additives to be likely to produce a decent return. When protein prices get over \$3.00 per lb., nutritionists agree it's very likely to give a good ROI. With protein paying an average of \$3.55/lb., it looks like there is a chance to get a good ROI with protein most months. April and May 2020 were exceptions to the rule.

"If something looks promising, make the change and give it enough time to take effect."

One of the big challenges some producers are facing is a mandatory reduction in milk volume with low prices paid on the excess milk above their reduction targets. These farms must reduce production below the target or be as efficient as possible with all feed inputs because the milk produced above excess is priced well below cost of production.

Conclusion: Feeding Strategy Advice for 2020

1. Target your lowest purchased feed cost per pound of component sold and highest Income over Purchased feed costs (IOPFC). Focusing on just milk volume or component test can hurt you in IOPFC.
2. Use forage to your advantage to help lower purchased feed costs in the rations.
3. Know what your net cost of butterfat and protein additives are in rations. Use net costs after offsetting other feed ingredients.
4. Check ROI periodically on your component additives. Be especially watchful during June through August because of the heat factor.
5. Monitor component pay prices regularly and be especially watchful for a two-to-three month low in the cycles. When component prices dip for more than a month at a time, this is when you want to pull back on additional component additive costs until prices climb back into the targeted range for ROI.
6. Don't be afraid to sit down with your nutritionist and model ration changes to see if you can improve IOPFC. If something looks promising, make the change and give it enough time to take effect.

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KNOWLEDGE EXCHANGE

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We look forward to your questions and feedback:

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