

TECHNICAL TOPICS

VOLUME 5

MILKING FOR COMPONENTS

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Federal Milk Order Component Pricing 2019		
Month	Butterfat Price	Protein Price
Jan	2.4981	1.1927
Feb	2.5345	1.1776
Mar	2.5461	1.6303
Apr	2.5375	1.989
May	2.5718	2.1159
Jun	2.6579	2.0046
Jul	2.6858	2.4032
Aug	2.6574	2.4453
Sep	2.4982	2.8633
Oct	2.4031	3.1700
Nov	2.3955	3.0839
Dec (Proj)	2.3208	3.9997

KEY TAKEAWAYS

- Higher butterfat and protein production will bulk up your milk check.
- Feed for higher butterfat by maintaining a consistent rumen environment that does not cause drops in rumen pH.
- Increase milk protein production through crude protein and amino acid balancing.
- Watch for seasonal butterfat and protein decreases in the summer and increases in the winter and adjust your ration accordingly.
- Monitor trends in federal milk order component pricing to determine if you should be aiming for more butterfat or more milk protein production to boost your milk check.




The majority of dairy producers in the Midwest are paid off of pounds of fat and protein produced. As such, total pounds of components can make or break a milk check. Fortunately, there are ways to manage your herd to help increase these valuable components.

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NUTRITION FOR HIGHER BUTTERFAT

The rumen of the cow is a big fermentation vat that supports microbes that breakdown ingredients into the nutrients needed for the cow to produce butterfat. The key in maintaining butterfat production is to support a high population of these fiber digesters. The rumen microbes generate the volatile fatty acids (VFA) needed for butterfat and protein production. One of the VFAs, acetate, is especially important to generate as half of butterfat produced by the cow is made in the udder using acetate. The other half of butterfat production comes from diet or body fat mobilization. You can support the cow through the diet by feeding products like palm fats which provide extra dietary fatty acids to the cow for improved butterfat production.

To support a desirable rumen microbe population, it is important to prevent inconsistency in the rumen environment, particularly variation in rumen pH. Anything that causes rumen pH to decrease will reduce the rumen microbe population desirable for production of milk fat precursors, causing a decrease in butterfat production. To prevent pH decreases in the rumen, keep an eye on the concentrate to forage ratio in the ration. Rapidly fermentable carbohydrates, like starches and sugars found in concentrate, can cause a drop in rumen pH if present in the ration at levels that are too high compared to forage amounts. As the amount of concentrate increases, there is more generation of the glucose precursor, propionate, rather than the milk fat synthesis precursor, acetate. In addition, to manage an increasing amount of concentrate in the ration you can supplement buffers or a higher positive electrolyte balance through use of sodium bicarb or potassium supplementation to support rumen microbe growth and activity.

GENETICS FOR BUTTERFAT

In addition to using nutrition, a strategy for higher butterfat production is to use genetics. Heritability estimates for components can be



used during sire selection. In fact, the most heritable traits are the component percentages for butterfat and protein. So the more you select for higher butterfat and protein percentages, the faster the herd will increase to higher butterfat and protein percentages. While this is certainly a slower route (i.e. generational), it is a good long-term viable route to higher butterfat and protein yields.

NUTRITION FOR PROTEIN

Trying to adjust milk protein has been much harder than adjusting milk fat, as we don't see nutrition influence the level of milk protein as much as we see for milk fat. A primary source of substrates for milk protein are made in the rumen from microbes converting dietary protein into microbial protein (MCP). In order to support production of milk protein, protein degraded in the rumen must meet the nitrogen needs of the rumen microbes for synthesis of MCP. The MCP provides the essential substrates, amino acids, for milk protein synthesis. In addition, protein that bypasses the rumen, called rumen undegradable protein (RUP), provide amino acids absorbed through the intestine. Together both MCP and RUP are needed for milk protein synthesis.

To support MCP in the rumen, there must be enough rumen degradable protein (RDP) available to support the growth and activity of the rumen microbes. The RDP is an estimate of protein available in rumen and is part of the nitrogen content of the feedstuffs in the ration.

A ration deficient in RDP will cause a decrease in the amount of milk protein produced as it will not provide enough nitrogen for the rumen microbe's activity. Have your nutritionist test your forages for protein content and formulate the proper protein mix to make sure the diet contains enough RDP. Keep in mind that feeding excessive RDP, like urea, can also cause low protein levels. The cow has to get rid of excess nitrogen and so it will make protein synthesis inefficient. You can monitor the milk urea nitrogen (MUN) level in your bulk tank tests to make sure there is not too much degradable protein. MUN levels should range from 10 to 12 units, and anything under or over that range can decrease milk protein.

The RUP supply comes from the portion of protein that bypasses the rumen and goes to the intestine to be absorbed. Most of the RUP supply comes from feed additives or commodity ingredients. Animal proteins like blood meal or meat and bone meal provide a concentrated source of RUP. These sources of RUP are not as palatable as others. Use of more palatable options like heat-treated soybean meal or distillers grains will provide RUP. There are also effective feed additives that will support RUP levels through providing straight essential amino acids. These products are called rumen-protected amino acids and should be put in a balanced protein formula to provide adequate amounts of amino acids.

MANAGEMENT FOR BUTTERFAT AND PROTEIN

To help maintain butterfat and protein production a consistent rumen environment is needed. Maintenance of your feed bunk is critical as variation in feed provided in the bunk will cause the cow to slug feed. Slug feeding is when the cow will ingest high amounts of feed a few times a day versus eating smaller meals many times throughout the day. Any compromise to rumen microbial growth and fermentation will be costly to production and components from the cows. It is nearly impossible to supplement around poorly managed feeding

program. The smaller meals multiple times throughout the day will keep a more balanced rumen environment that will better support the rumen microbes needed for butterfat and protein synthesis. In addition, free-choice salt and sodium bicarb will help provide additional support to those cows that might have gone off feed due to discomfort or for recently fresh cows. Sodium bicarb stabilizes rumen pH and salt will help the cow drink more water to also stabilize rumen pH.

SEASONAL FAT AND PROTEIN

In the summer, cows will produce fewer components, driven primarily by the change in day length. There will be fewer de novo fats synthesized, so it is critical to provide dietary fats during the summer months to keep the fat content higher. During later summer months, you may observe your butterfat dropping significantly. Most people assume this is due to heat stress effects on the cow. While that is very likely to be true, another contributing factor is the time corn silage and/or high moisture shell corn has been in storage and the relative availability of starch. The longer these crops are stored, prolamin surrounding the starch is breaking down. This makes the starch more available for the cow to digest, causing the starch to become like rocket fuel in the rumen, rapidly lowering rumen pH. This in turn causes microbes for butterfat precursors to die off, subsequently reducing butterfat production.

To balance out the high digestible starch, talk with your nutritionist on solutions for the diet. These might include lowering starch percent or using alternatives to replace high moisture corn. Keep in mind that a two-unit decrease in components is quite typical for the seasonal change when trying to increase components through nutrition.

HOW DOES THE MILK CHECK FIT INTO YOUR COMPONENT PRODUCTION?

Class III milk price is calculated from butterfat and protein. For the month of October 2019, butterfat was \$2.4031 per pound and protein was \$3.17 per

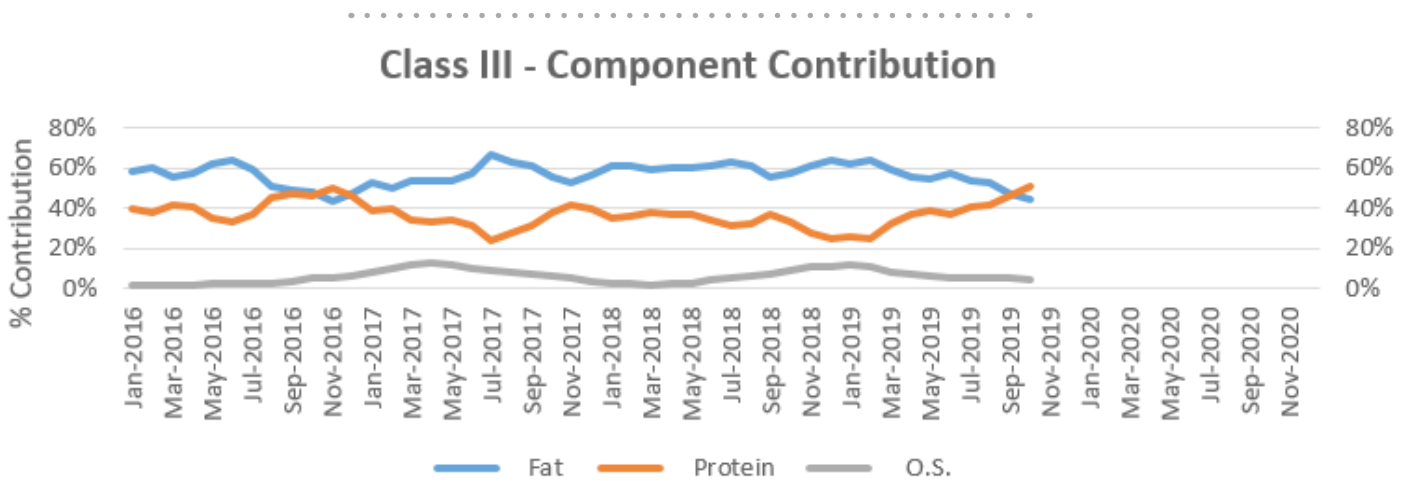
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pound. Increasing your fat by 0.1%, would lead to a \$0.24 per hundredweight increase in your milk check. An additional 0.1% increase in milk protein % would yield another \$0.32 per hundredweight. Class III milk price for October 2019 was \$18.72 per hundredweight. Adjusting for increased butterfat and protein percentages described above results in a total of \$19.28 per hundredweight, \$0.56 over the Federal Milk Marketing Order. For every 100 cows with an 80 pound milk average, the result would be an additional \$1,344 that month for the 0.1% increase in fat and protein.

It is important to monitor the trend of the butterfat and protein pricing as well. The month of September and October were different versus the whole year as the price of protein jumped over the price of butterfat. The trend since January 2019 was to aim for more butterfat production as the price was highest for that component. Since March, however, the price of protein steadily climbed, but it took until September for the price to surpass butterfat. It is impossible to predict what the market will do for component pricing, but it is good to be aware of market changes so you can attempt to adjust by investing in nutritional strategies like protected amino acids to increase your components for a higher milk check. Ask your nutritionist when it makes sense to do this on your dairy.

Increasing butterfat and protein components can be tricky, but because these components are a large part of your milk check, optimizing their production remains a top priority. Following the advice presented in this article is a start toward improved butterfat and protein production.

References are available upon request.



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