

Could FMMO Protein Price Become Negative?

Given the importance that consumers and the dairy industry associate with dairy proteins it seems inconceivable that the Federal Milk Marketing Order (FMMO) protein price could become negative. To understand this phenomenon, it is important to review FMMO price formulas. In simplest terms:

Cheese price – butter price = protein price

The protein price formula is more complex than the equation given above but the basic premise is that protein value is the residual value after butterfat value is subtracted from cheese value. High cheese prices and low to moderate butter prices result in high protein prices. The table on Page 2 shows prices for select months from 2020 through 2023 for butter and cheese from the National Dairy Products Sales Report (NDPSR). These commodity prices are used to calculate FMMO component prices. The table demonstrates that when cheese prices exceed or are relatively close to butter prices, protein prices are higher than butterfat prices. However, when butter prices are substantially higher than cheese prices, butterfat prices can be twice as high as protein prices or even greater.

Looking at the current situation, Chicago Mercantile Exchange (CME) cash prices for butter and cheese on October 2 at the were:

- \$3.34 per pound for butter,
- \$1.72 per pound for block cheese, and
- \$1.5425 for barrel cheese.

The FMMO protein price formula adds \$0.03 per pound to the barrel cheese price and then averages the block and barrel prices to determine the cheese price. Based on that methodology, that day's CME cheese prices convert to a price of \$1.6462/lb. Combined with that day's butter price, FMMO component prices would be \$3.8371 for butterfat and \$0.6186 for protein.

The good news is that producers will benefit

from record-high butterfat prices. 2023 year-to-date FMMO butterfat tests average 4.07%, meaning the butterfat value of producer milk checks in the multiple component pricing orders would be worth \$15.62/cwt. However, based on average protein tests of 3.24%, the protein content will only be worth \$2.00/cwt. Adding in the value of other solids, \$0.50/cwt., the Class III value of average producer milk would be \$18.12/cwt.

So, back to the question posed in the headline of this newsletter, could FMMO protein prices turn negative? For that to happen the butter price would need to increase to \$3.50/lb. and the cheese price would need to slide to \$1.50. Are those prices probable? Perhaps not. Are those prices possible? Yes.

How did we get here?

What's driven prices into this situation? First, American consumers love butter, and 2023 is the second consecutive year in which CME cash butter prices have set record high prices. Consumers' butter affection is particularly strong during the holiday season. Many retailers report that 50% of their annual butter sales happen during the last three months of the year. Therefore, retailers prefer to build butter inventories throughout the year leading up to fourth quarter sales. However, through the first seven months of this year domestic butter consumption increased 92.2 million pounds over last year as reported by USDA's Economic Research Service (ERS). So, even though butter production this year increased 50.5 million pounds from January through July compared to 2022, it wasn't enough to keep pace with the increase in domestic demand. As a result, retailers find themselves heading into the holiday season scrambling for butter and driving butter prices to record levels for a second consecutive year.

What does the future hold?

If last year provides a guide, the CME butter price

will remain high until near the holiday season, and then fall hard. Last year's price peaked in early November but fell by \$0.60/lb. by the end of the year. A similar pattern could be followed this year. If last year's sudden and steep price drop materializes, the current butter-cheese price relationship will be short-lived. But if the current price relationship remains in effect for even two months, producer milk checks will be based almost entirely on butterfat value for those two months. However, it is important to realize that a significant difference this year is that California's milk production is below 2022, and California produces about one-third of the nation's butter.

Looking further into the future, five large scale commodity cheese plants are known to be coming into production during late 2024 and early 2025. Industry estimates are that those plants will add 5% to 7% to total cheese production and perhaps dampen cheese prices, thus continuing the price relationship of butter prices remaining significantly higher than cheese prices through 2025.

Butter production compared to cheese.

It is undeniable that cheese price plays a significant role in the protein price. If cheese prices were \$0.15 to \$0.25 higher than they are, the hypothetical question of negative protein prices would not surface even though butter prices would still be at a significant premium to cheese prices. However, the current market situation amplifies the significant influence that the butter price has in determining the protein price even though the production of the two commodities is nowhere near equal. Through July this year 1.3 billion pounds of

butter had been manufactured compared to 8.2 billion pounds of cheese.

Impact on Fat-Skim Orders

Producers pooled in the fat-skim orders will not escape the impact of low or possibly negative protein prices even though they aren't directly paid for protein. The protein price comprises a significant portion of the Class III skim milk price. Based on October 2nd's CME cash prices, the Class III skim milk price would be only \$2.42/cwt. Combined with the Class IV skim milk price of \$9.06/cwt., the Class I skim milk price calculates to be \$6.48. The record-high butter prices would make the announced Class I price to be \$19.69/cwt. However, the announced Class I price is based on 3.5% butterfat. Pooled Class I milk typically averages 2.25% butterfat,

which means producers would realize Class I revenue of \$14.97/cwt. The difference is nearly \$5.00/cwt. less than the announced price due to the 1.25% difference between the

butterfat level used to calculate the announced price and the 2.25% butterfat that is marketed in fluid milk.

No doubt today's record high butter prices will translate into record high butterfat prices for producers. Furthermore, producers market far more butterfat than protein. However, it is important to know ahead of time what the combination of record butter prices and moderate cheese prices will mean for protein prices. If history repeats itself the current butter-cheese price relationship will be temporary, although the coming influx of more cheese production promises to keep butter and butterfat prices higher than cheese and protein prices.

Relationship Between Commodity and Component Prices					
		Prices			
Month	Source	Butter	Cheese	Butterfat	Protein
Oct. 2023	CME Cash	\$3.3400	\$ 1.6462	\$ 3.7371	\$ 0.6186
Jul. 2023	USDA/AMS	\$2.4825	\$ 1.4870	\$ 2.7986	\$ 1.1991
Apr. 2023	USDA/AMS	\$ 2.4018	\$ 1.8775	\$ 2.7009	\$ 2.5603
Sept. 2022	USDA/AMS	\$ 3.1156	\$ 1.9503	\$ 3.5653	\$ 1.8847
May. 2022	USDA/AMS	\$ 2.7360	\$ 2.4161	\$ 3.1056	\$ 3.8696
Dec. 2021	USDA/AMS	\$ 2.0641	\$ 1.7542	\$ 2.2919	\$ 2.5937
Feb. 2021	USDA/AMS	\$ 1.3586	\$ 1.5954	\$ 1.4376	\$ 2.9816
Jul. 2020	USDA/AMS	\$ 1.7886	\$ 2.5873	\$ 1.9583	\$ 5.6294

August '23 STATISTICAL BLEND PRICE		August '23 MONTHLY MILK VOLUME (Million #)		August '23 JERSEY REGULATED BLEND PRICE	
Northeast (Boston)	\$19.43	Northeast (Boston)	2,310	Northeast (Boston)	\$23.28
Appalachian (Charlotte)	\$20.13	Appalachian (Charlotte)	445	Appalachian (Charlotte)	\$23.02
Southeast (Atlanta)	\$20.67	Southeast (Atlanta)	272	Southeast (Atlanta)	\$23.44
Florida (Tampa)	\$21.84	Florida (Tampa)	213	Florida (Tampa)	\$24.85
Mideast (Cleveland)	\$18.07	Mideast (Cleveland)	1,395	Mideast (Cleveland)	\$21.17
Upper Midwest (Chicago)	\$17.35	Upper Midwest (Chicago)	2,797	Upper Midwest (Chicago)	\$21.12
Central (Kansas City)	\$17.87	Central (Kansas City)	1,214	Central (Kansas City)	\$21.01
California (Los Angeles)	\$17.96	California (Los Angeles)	2,101	California (Los Angeles)	\$19.20
Southwest (Dallas)	\$18.52	Southwest (Dallas)	1,124	Southwest (Dallas)	\$21.55
Arizona (Phoenix)	\$18.62	Arizona (Phoenix)	364	Arizona (Phoenix)	\$21.56
Pacific Northwest (Seattle)	\$17.97	Pacific Northwest (Seattle)	623	Pacific Northwest (Seattle)	\$20.32
ALL FMMO MARKET AVERAGE	\$18.95	ALL FMMO MARKET TOTAL	12,856	ALL FMMO MARKET AVERAGE	\$21.87
Prices reflect Federal Order minimum blend prices for city shown.					
August, '23 JERSEY BLEND WITH ESTIMATED PROTEIN OR CHEESE YIELD PREMIUMS		August '23 DOLLAR DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE		August '23 PERCENT DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE	
Prices reflect FMMO minimum prices at Jersey component values.					
Northeast (Boston)	\$23.52	Northeast (Boston)	\$4.09	Northeast (Boston)	21.1%
Appalachian (Charlotte) (includes protein prem.)	\$23.35	Appalachian (Charlotte)	\$3.22	Appalachian (Charlotte)	16.0%
Southeast (Atlanta)	\$23.44	Southeast (Atlanta)	\$2.77	Southeast (Atlanta)	13.4%
Florida (Tampa)	\$24.85	Florida (Tampa)	\$3.01	Florida (Tampa)	13.8%
Mideast (Cleveland) (includes protein premium)	\$21.61	Mideast (Cleveland)	\$3.54	Mideast (Cleveland)	19.6%
Upper Midwest (Chicago) (includes cy premium)	\$21.35	Upper Midwest (Chicago)	\$4.00	Upper Midwest (Chicago)	23.1%
Central (Kansas City)	\$21.01	Central (Kansas City)	\$3.14	Central (Kansas City)	17.6%
California (Los Angeles)	\$19.20	California (Los Angeles)	\$1.24	California (Los Angeles)	6.9%
Southwest (Dallas)	\$21.55	Southwest (Dallas)	\$3.03	Southwest (Dallas)	16.4%
Arizona (Phoenix) (includes protein)	\$21.87	Arizona (Phoenix)	\$3.25	Arizona (Phoenix)	17.5%
Pacific Northwest (Seattle)	\$20.32	Pacific Northwest (Seattle)	\$2.35	Pacific Northwest (Seattle)	13.1%
ALL FMMO MARKET AVERAGE	\$22.01	ALL FMMO MARKET AVERAGE	\$3.06	ALL FMMO MARKET AVERAGE	16.2%
Includes a protein premium of \$0.05 for every 0.01% increase in protein over the market average.					
ESTIMATED JERSEY MILK COMPOSITION		REGULATED MILK PRICES		AVERAGE JERSEY PRICE ADJUSTMENT PER CWT:	
Butterfat	4.83	FMMO Milkfat	\$ 3.0218	FMMO Milkfat Adjustment	\$2.49
TRUE Protein	3.73	FMMO True Protein	\$ 2.0851	FMMO True Protein Adjustment	\$0.86
Other Solids	5.73	FMMO Other Solids	\$ 0.0648	FMMO Other Solids Adjustment	(\$0.01)
Solids Not Fat (SNF)	9.46				
Cheese Yield (90% Fat Recovery, 38% Moisture)	12.89				
CME Block Cheese Price	\$ 1.98				
Percent difference in Jersey price with premiums, over the statistical blend price.					

Percent difference in Jersey price with premiums, over the statistical blend price.

Prices reflect difference between Jersey price with premiums, and the statistical blend price.

Milk & Component Outlook - 2023 Prices through August

2023 AVERAGE STATISTICAL BLEND PRICE FOR EACH FEDERAL ORDER		2023 MILK VOLUME (Million #)	2023 AVERAGE JERSEY REGULATED BLEND PRICE	
Northeast (Boston)	\$19.74	Northeast (Boston)	18,408	\$23.55
Appalachian (Charlotte)	\$21.46	Appalachian (Charlotte)	3,703	\$24.53
Southeast (Atlanta)	\$22.01	Southeast (Atlanta)	2,377	\$25.07
Florida (Tampa)	\$23.57	Florida (Tampa)	1,660	\$26.79
Mideast (Cleveland)	\$18.46	Mideast (Cleveland)	11,890	\$22.01
Upper Midwest (Chicago)	\$17.27	Upper Midwest (Chicago)	22,385	\$20.79
Central (Kansas City)	\$18.11	Central (Kansas City)	10,941	\$21.54
California (Los Angeles)	\$18.18	California (Los Angeles)	18,202	\$19.35
Southwest (Dallas)	\$18.83	Southwest (Dallas)	9,298	\$22.17
Arizona (Phoenix)	\$19.02	Arizona (Phoenix)	3,446	\$22.10
Pacific Northwest (Seattle)	\$18.14	Pacific Northwest (Seattle)	5,265	\$20.89
ALL FMMO MARKET AVERAGE	\$19.53	ALL FMMO MARKET TOTAL	107,575	\$22.62

Prices reflect Federal Order minimum blend prices for city shown.

Total Grade A milk volume sold under FMMO.

Prices reflect FMMO minimum prices at Jersey component values.

2023 AVERAGE JERSEY BLEND WITH ESTIMATED PROTEIN OR CHEESE YIELD PREMIUMS		2023 AVERAGE DOLLAR DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE		2023 AVERAGE PERCENT DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE	
Northeast (Boston)	\$23.81	Northeast (Boston)	\$4.06	Northeast (Boston)	20.5%
Appalachian (Charlotte) (includes protein prem.)	\$24.90	Appalachian (Charlotte)	\$3.22	Appalachian (Charlotte)	14.9%
Southeast (Atlanta)	\$25.07	Southeast (Atlanta)	\$2.90	Southeast (Atlanta)	13.1%
Florida (Tampa)	\$26.79	Florida (Tampa)	\$3.27	Florida (Tampa)	13.9%
Mideast (Cleveland) (includes protein premium)	\$22.51	Mideast (Cleveland)	\$4.09	Mideast (Cleveland)	22.0%
Upper Midwest (Chicago) (includes cy premium)	\$21.06	Upper Midwest (Chicago)	\$3.81	Upper Midwest (Chicago)	22.1%
Central (Kansas City)	\$21.54	Central (Kansas City)	\$3.51	Central (Kansas City)	19.5%
California (Los Angeles)	\$19.35	California (Los Angeles)	\$1.28	California (Los Angeles)	6.9%
Southwest (Dallas)	\$22.17	Southwest (Dallas)	\$3.41	Southwest (Dallas)	18.2%
Arizona (Phoenix) (includes protein)	\$22.46	Arizona (Phoenix)	\$3.45	Arizona (Phoenix)	18.2%
Pacific Northwest (Seattle)	\$20.89	Pacific Northwest (Seattle)	\$2.79	Pacific Northwest (Seattle)	15.4%
ALL FMMO MARKET AVERAGE	\$22.78	ALL FMMO MARKET AVERAGE	\$3.25	ALL FMMO MARKET AVERAGE	16.8%

Includes a protein premium of \$0.05 for every 0.01% increase in protein over the market average.

Prices reflect difference between Jersey price with premiums, and the statistical blend price.

Percent difference in Jersey price with premiums, over the statistical blend price.

ESTIMATED JERSEY MILK COMPOSITION		2023	REGULATED MILK PRICES		2023	AVERAGE JERSEY PRICE ADJUSTMENT PER CWT:		2023
Butterfat		4.93	FMMO Milkfat		\$2.7823	FMMO Milkfat Adjustment		\$2.57
TRUE Protein		3.83	FMMO True Protein		\$2.0923	FMMO True Protein Adjustment		\$1.22
Other Solids		5.73	FMMO Other Solids		\$0.1718	FMMO Other Solids Adjustment		(\$0.01)
Solids Not Fat (SNF)		9.56						
Cheese Yield (90% Fat Recovery, 38% Moisture)		13.20						
CME Block Cheese Price		\$1.77						