

UPDATED: Forecasting Your Mailbox Milk Price *An Application to Forecast Mailbox Prices for Individual Dairies*

Many variables factor into determining the mailbox price for individual dairies. Most producer milk prices are based off of announced, standardized prices, such as the Federal Milk Marketing Order Class III price. However, variables unique to each dairy impact the final milk price for individual dairies. These variables include, but are not limited to, butterfat and protein percentages, premiums for quality and volume, and hauling. Therefore, no dairy is paid exactly the Class III price, which is based on milk testing 3.5% butterfat, 2.99% true protein and 5.69% other solids. Given that Jersey milk is significantly higher in butterfat and protein than the Class III standard, mailbox prices for Jersey milk are also substantially higher than the announced Class III price. However, over time, a predictable relationship exists between the Class III price and each individual dairy's mailbox milk price.

National All-Jersey Inc. (NAJ) partially funded a project led by Dr. Brian Gould of the University of Wisconsin-Madison to develop an application to forecast mailbox prices for individual dairies for a 12 month period. **The web program became available last month and is available at (<https://dairy.aae.wisc.edu/>).** **This is an updated version of the previous Excel platform.** Once on the website click the “Dairy Marketing Tools” tab in the upper right corner. Then scroll down and select the “Mailbox Milk Price Forecaster”. You will then need to complete the registration to get yourself into the system.

The price forecast uses three processes. First, it compares the dairy's historical mailbox prices to historical Class III and IV prices to determine the relationship between the two prices, known as basis. Second, the analysis uses previous monthly butterfat and protein tests to project monthly component levels into the future. Finally, the analysis accesses current Class III and IV futures prices and combines them with the dairy's historical basis and projected components to forecast a mailbox price for the following 12 months.

Getting Started

Before starting the forecast process, three pieces of monthly data are needed from your dairy: (1) mailbox milk prices, (2) butterfat tests and (3) protein tests. In order to work well, the model requires the four most recent years of monthly data. Having data from additional years adds to the reliability of the forecast. Ten to fifteen years-worth of data is ideal.

Using the Mailbox Predictor

You will enter your monthly mailbox prices first. Then select **Save** and then select **Fat%**.

Mailbox Prices

Enter mailbox price as decimal
Ex. Enter \$12.35 as '12.35' (do not type quotes)

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2004 | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | |
| 2014 | 32.24 | 34.06 | 33.62 | 31.85 | 28.94 | 28.61 | 29.40 | 30.94 | 34.02 | 34.34 | 31.85 | 27.86 |
| 2015 | 24.17 | 22.82 | 21.25 | 20.12 | 19.92 | 19.64 | 20.08 | 21.04 | 24.25 | 24.97 | 27.28 | 25.98 |
| 2016 | 23.40 | 23.55 | 21.36 | 19.20 | 18.15 | 17.89 | 19.87 | 21.72 | 22.38 | 21.54 | 22.37 | 24.16 |
| 2017 | 24.42 | 23.44 | 22.71 | 20.69 | 20.55 | 21.42 | 22.74 | 23.40 | 23.79 | | | |

Mailbox Price
Fat %
Protein %
Save

The **Butterfat %** screen will open. Enter your butterfat tests into the empty cells for the appropriate month and year. When completed, select **Save**.

Then select **Protein %**. A new screen will be displayed with **Protein %** at the top. Enter your information, then select **Save**.

Butterfat %

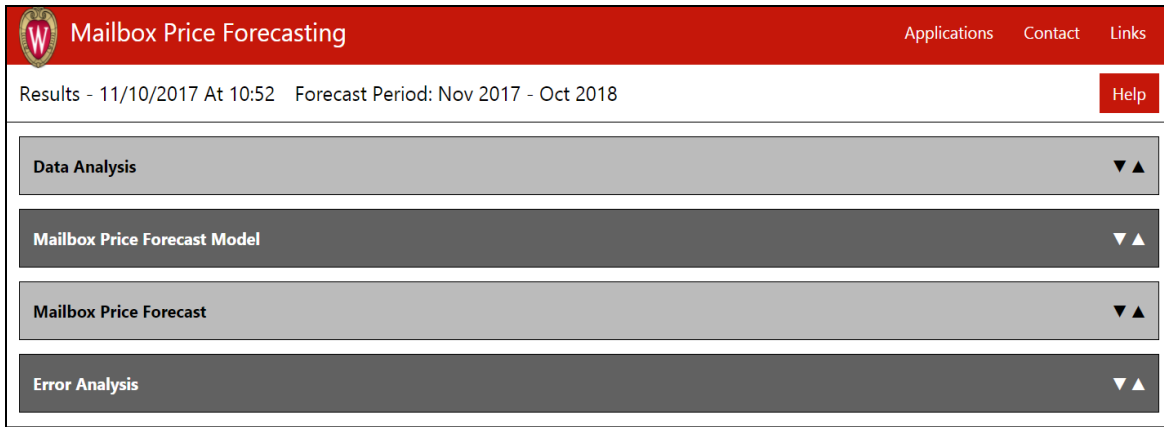
Enter component butterfat % as decimal
Ex. Enter 3.50% as '3.50' (do not type quotes)

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2004 | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | |
| 2014 | 5.29 | 5.31 | 5.13 | 4.81 | 4.56 | 4.63 | 4.74 | 4.79 | 4.94 | 5.09 | 5.25 | 5.16 |
| 2015 | 5.26 | 5.32 | 5.08 | 4.84 | 4.59 | 4.60 | 4.59 | 4.70 | 5.02 | 5.31 | 5.41 | 5.50 |
| 2016 | 5.52 | 5.49 | 5.34 | 4.93 | 4.74 | 4.49 | 4.62 | 4.87 | 5.11 | 5.29 | 5.30 | 5.40 |
| 2017 | 5.38 | 5.34 | 5.15 | 4.96 | 4.82 | 4.63 | 4.71 | 4.86 | 5.19 | | | |

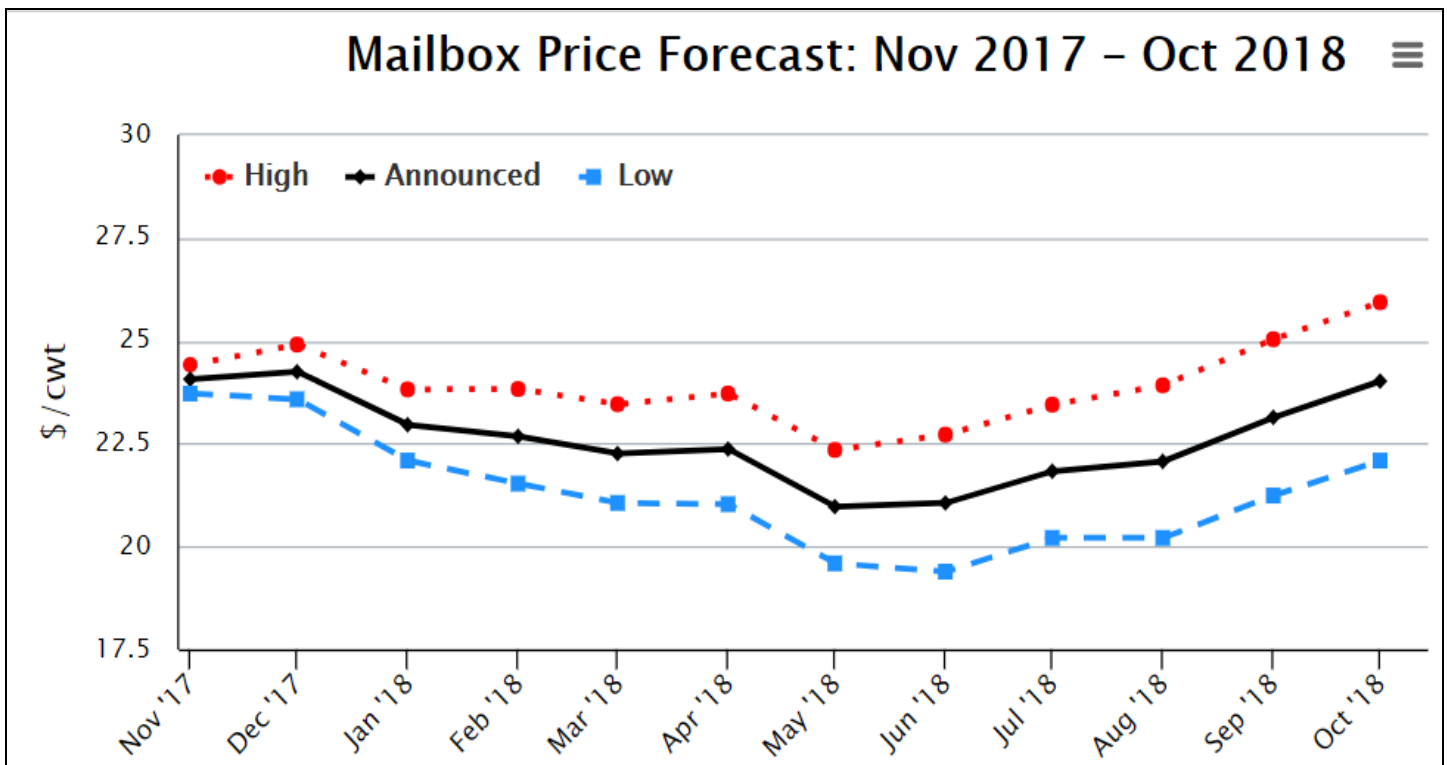
Mailbox Price
Fat %
Protein %
Save

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The next step is to select your **Forecast Options** to the right of the data entry area. The **Data Range Start** and **End** parameters must be set within the timespan that data is entered for. You can then select if you want to use the component data that you entered. The component options allow you to use last year’s values, last year’s average, or custom values. Then select the **Forecast** button. The screen below will then be presented.



Your mailbox price forecast for the next 12 months will be displayed under the **Mailbox Price Forecast** tab. You will see the forecast in a graph and table format, along with projected upper and lower ranges.



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Forecast Values

| Forecast Month | Forecast Price | Class III Future Price | Class IV Future Price |
|----------------|----------------|------------------------|-----------------------|
| Nov | \$24.07 | \$16.54 | \$13.83 |
| Dec | \$24.25 | \$15.69 | \$13.91 |
| Jan | \$22.96 | \$15.38 | \$13.90 |
| Feb | \$22.68 | \$15.29 | \$14.04 |
| Mar | \$22.26 | \$15.17 | \$14.23 |
| Apr | \$22.37 | \$15.25 | \$14.45 |
| May | \$20.97 | \$15.38 | \$14.66 |
| Jun | \$21.06 | \$15.67 | \$14.87 |
| Jul | \$21.83 | \$15.96 | \$15.14 |
| Aug | \$22.07 | \$16.09 | \$15.30 |
| Sept | \$23.14 | \$16.19 | \$15.51 |
| Oct | \$24.02 | \$16.17 | \$15.73 |

Statistical analysis of mailbox price forecast for Nov 2017 - Oct 2018

| | Average | Standard Dev. | Max | Min |
|---------------|---------|---------------|---------|---------|
| Mailbox Price | \$22.64 | \$1.06 | \$24.25 | \$20.97 |
| Fat % | 5.10% | 0.30% | 5.40% | 4.60% |
| Protein % | 3.70% | 0.10% | 4.00% | 3.50% |

Other Tabs

The **Data Analysis** tab looks at the data that you entered, providing a graph of your previous mailbox prices. The **Mailbox Price Forecast Model** tab goes over the mathematical model for the mailbox price forecasts and shows the forecast values. The **Error Analysis** tab looks at the statistical error in the forecast model.

You may want to bookmark the link to the program and record your login information; doing this will allow you to update the information on a regular basis when you obtain new mailbox prices or when you want to re-estimate your mailbox forecast to reflect current market conditions.

Please direct questions or concerns about this tool to NAJ at naj@usjersey.com or Dr. Gould at bwgould@wisc.edu.

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NAJ Milk & Component Outlook - September 2017 Jersey Price Comparisons

| <u>SEPT '17 STATISTICAL BLEND PRICE</u> | | <u>SEPT '17 MONTHLY MILK VOLUME</u> (Million #) | | <u>SEPT '17 JERSEY REGULATED BLEND PRICE</u> | |
|---|----------------|--|---------------|--|----------------|
| Northeast (Boston) | \$17.89 | Northeast (Boston) | 2,180 | Northeast (Boston) | \$22.13 |
| Appalachian (Charlotte) | \$19.06 | Appalachian (Charlotte) | 473 | Appalachian (Charlotte) | \$22.53 |
| Southeast (Atlanta) | \$19.61 | Southeast (Atlanta) | 408 | Southeast (Atlanta) | \$23.10 |
| Florida (Tampa) | \$21.14 | Florida (Tampa) | 203 | Florida (Tampa) | \$24.71 |
| Mideast (Cleveland) | \$17.00 | Mideast (Cleveland) | 1,616 | Mideast (Cleveland) | \$21.11 |
| Upper Midwest (Chicago) | \$16.54 | Upper Midwest (Chicago) | 3,190 | Upper Midwest (Chicago) | \$20.82 |
| Central (Kansas City) | \$16.72 | Central (Kansas City) | 1,419 | Central (Kansas City) | \$20.91 |
| Southwest (Dallas) | \$17.58 | Southwest (Dallas) | 1,194 | Southwest (Dallas) | \$21.55 |
| Arizona (Phoenix) | \$16.89 | Arizona (Phoenix) | 397 | Arizona (Phoenix) | \$20.66 |
| Pacific Northwest (Seattle) | \$16.59 | Pacific Northwest (Seattle) | 717 | Pacific Northwest (Seattle) | \$20.01 |
| ALL FMMO MARKET AVERAGE | \$17.90 | ALL FMMO MARKET TOTAL | 11,798 | ALL FMMO MARKET AVERAGE | \$21.75 |
| California 4b (Cheese Milk) | \$14.88 | | | California 4b (Cheese Milk) | \$19.22 |
| California Overbase | \$15.25 | | | California Overbase | \$19.66 |

Prices reflect Federal Order minimum blend prices for city shown.

Total Grade A milk volume sold under FMMO during month.

Prices reflect FMMO minimum prices at Jersey component values.

| <u>SEPT '17 JERSEY BLEND WITH ESTIMATED PROTEIN OR CHEESE YIELD PREMIUMS</u> | | <u>SEPT '17 DOLLAR DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE</u> | | <u>SEPT '17 PERCENT DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE</u> | |
|--|----------------|--|---------------|---|--------------|
| Northeast (Boston) | \$22.35 | Northeast (Boston) | \$4.46 | Northeast (Boston) | 25.0% |
| Appalachian (Charlotte) (includes protein prem.) | \$22.87 | Appalachian (Charlotte) | \$3.81 | Appalachian (Charlotte) | 20.0% |
| Southeast (Atlanta) | \$23.10 | Southeast (Atlanta) | \$3.49 | Southeast (Atlanta) | 17.8% |
| Florida (Tampa) | \$24.71 | Florida (Tampa) | \$3.57 | Florida (Tampa) | 16.9% |
| Mideast (Cleveland) (includes protein premium) | \$21.67 | Mideast (Cleveland) | \$4.67 | Mideast (Cleveland) | 27.5% |
| Upper Midwest (Chicago) (includes cy premium) | \$21.05 | Upper Midwest (Chicago) | \$4.51 | Upper Midwest (Chicago) | 27.3% |
| Central (Kansas City) | \$20.91 | Central (Kansas City) | \$4.19 | Central (Kansas City) | 25.1% |
| Southwest (Dallas) | \$21.55 | Southwest (Dallas) | \$3.97 | Southwest (Dallas) | 22.6% |
| Arizona (Phoenix) (includes protein) | \$20.98 | Arizona (Phoenix) | \$4.09 | Arizona (Phoenix) | 24.2% |
| Pacific Northwest (Seattle) | \$20.01 | Pacific Northwest (Seattle) | \$3.42 | Pacific Northwest (Seattle) | 20.6% |
| ALL FMMO MARKET AVERAGE | \$21.92 | ALL FMMO MARKET AVERAGE | \$4.02 | ALL FMMO MARKET AVERAGE | 22.7% |
| California 4b (Includes CY Premium) | \$20.47 | California 4b (Includes CY Premium) | \$5.59 | California 4b (Includes CY Premium) | 37.6% |
| California Overbase | \$20.92 | California Overbase | \$5.67 | California Overbase | 37.2% |

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.

| <u>ESTIMATED JERSEY MILK COMPOSITION</u> | <u>Sep-17</u> | <u>REGULATED MILK PRICES</u> | <u>Sep-17</u> | <u>AVERAGE JERSEY PRICE ADJUSTMENT PER CWT:</u> | <u>Sep-17</u> |
|---|---------------|------------------------------|---------------|---|---------------|
| Butterfat | 4.92 | FMMO Milkfat | \$ 2.8559 | FMMO Milkfat Adjustment | \$3.24 |
| TRUE Protein | 3.75 | FMMO True Protein | \$ 1.6988 | FMMO True Protein Adjustment | \$1.02 |
| Other Solids | 5.73 | FMMO Other Solids | \$ 0.2241 | FMMO Other Solids Adjustment | (\$0.00) |
| Solids Not Fat (SNF) | 9.48 | CA 4b (Cheese Milk) Milkfat | \$ 2.7168 | CA 4b (Cheese Milk) Milkfat | \$3.86 |
| Cheese Yield (90% Fat Recovery, 38% Moisture) | 12.97 | CA 4b (Cheese Milk) SNF | \$ 0.6175 | CA 4b (Cheese Milk) SNF | \$0.49 |
| | | CA Overbase Milkfat | \$ 2.7540 | CA Overbase Milkfat | \$3.91 |
| CME Block Cheese Price | \$ 1.64 | CA Overbase SNF | \$ 0.6450 | CA Overbase SNF | \$0.50 |

NAJ Milk & Component Outlook - 2017 Prices through September

| 2017 AVERAGE STATISTICAL BLEND PRICE FOR EACH FEDERAL ORDER | | 2017 MILK VOLUME (Million #) | | 2017 AVERAGE JERSEY REGULATED BLEND PRICE | |
|--|----------------|---------------------------------|----------------|---|----------------|
| Northeast (Boston) | \$17.54 | Northeast (Boston) | 20,713 | Northeast (Boston) | \$21.35 |
| Appalachian (Charlotte) | \$19.05 | Appalachian (Charlotte) | 4,308 | Appalachian (Charlotte) | \$22.34 |
| Southeast (Atlanta) | \$19.29 | Southeast (Atlanta) | 4,152 | Southeast (Atlanta) | \$22.65 |
| Florida (Tampa) | \$20.54 | Florida (Tampa) | 1,939 | Florida (Tampa) | \$24.20 |
| Mideast (Cleveland) | \$16.67 | Mideast (Cleveland) | 15,560 | Mideast (Cleveland) | \$20.44 |
| Upper Midwest (Chicago) | \$16.28 | Upper Midwest (Chicago) | 25,438 | Upper Midwest (Chicago) | \$20.14 |
| Central (Kansas City) | \$16.45 | Central (Kansas City) | 12,508 | Central (Kansas City) | \$20.25 |
| Southwest (Dallas) | \$17.29 | Southwest (Dallas) | 10,334 | Southwest (Dallas) | \$20.84 |
| Arizona (Phoenix) | \$16.53 | Arizona (Phoenix) | 3,870 | Arizona (Phoenix) | \$19.91 |
| Pacific Northwest (Seattle) | \$16.35 | Pacific Northwest (Seattle) | 5,860 | Pacific Northwest (Seattle) | \$19.55 |
| ALL FMMO MARKET AVERAGE | \$17.60 | ALL FMMO MARKET TOTAL | 104,681 | ALL FMMO MARKET AVERAGE | \$21.17 |
| California 4b (Cheese Milk) | \$15.24 | | | California 4b (Cheese Milk) | \$19.39 |
| California Overbase | \$15.35 | | | California Overbase | \$19.49 |

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.

| 2017 AVERAGE JERSEY BLEND WITH ESTIMATED PROTEIN OR CHEESE YIELD PREMIUMS | | 2017 AVERAGE DOLLAR DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE | | 2017 AVERAGE PERCENT DIFFERENCE: JERSEY MILK WITH PREMIUMS VS. STATISTICAL BLEND PRICE | |
|--|----------------|--|---------------|---|--------------|
| Northeast (Boston) | \$21.57 | Northeast (Boston) | \$4.02 | Northeast (Boston) | 23.0% |
| Appalachian (Charlotte) (includes protein prem.) | \$22.67 | Appalachian (Charlotte) | \$3.36 | Appalachian (Charlotte) | 17.5% |
| Southeast (Atlanta) | \$22.65 | Southeast (Atlanta) | \$3.12 | Southeast (Atlanta) | 16.0% |
| Florida (Tampa) | \$24.20 | Florida (Tampa) | \$3.23 | Florida (Tampa) | 15.4% |
| Mideast (Cleveland) (includes protein premium) | \$21.00 | Mideast (Cleveland) | \$4.31 | Mideast (Cleveland) | 25.9% |
| Upper Midwest (Chicago) (includes cy premium) | \$20.36 | Upper Midwest (Chicago) | \$4.06 | Upper Midwest (Chicago) | 24.9% |
| Central (Kansas City) | \$20.25 | Central (Kansas City) | \$3.79 | Central (Kansas City) | 23.0% |
| Southwest (Dallas) | \$20.84 | Southwest (Dallas) | \$3.57 | Southwest (Dallas) | 20.7% |
| Arizona (Phoenix) (includes protein) | \$20.23 | Arizona (Phoenix) | \$3.68 | Arizona (Phoenix) | 22.3% |
| Pacific Northwest (Seattle) | \$19.55 | Pacific Northwest (Seattle) | \$3.22 | Pacific Northwest (Seattle) | 19.8% |
| ALL FMMO MARKET AVERAGE | \$21.33 | ALL FMMO MARKET AVERAGE | \$3.64 | ALL FMMO MARKET AVERAGE | 20.8% |
| California 4b (Includes CY Premium) | \$20.63 | California 4b (Includes CY Premium) | \$5.40 | California 4b (Includes CY Premium) | 35.4% |
| California Overbase | \$20.73 | California Overbase | \$5.39 | California Overbase | 35.1% |

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 | 2017 | REGULATED MILK PRICES | 2017 | AVERAGE JERSEY PRICE ADJUSTMENT PER CWT: | 2017 |
|---|--------|-----------------------------|----------|--|----------|
| Butterfat | 4.90 | FMMO Milkfat | \$2.6286 | FMMO Milkfat Adjustment | \$2.97 |
| TRUE Protein | 3.74 | FMMO True Protein | \$1.7701 | FMMO True Protein Adjustment | \$1.06 |
| Other Solids | 5.73 | FMMO Other Solids | \$0.2851 | FMMO Other Solids Adjustment | (\$0.01) |
| Solids Not Fat (SNF) | 9.47 | CA 4b (Cheese Milk) Milkfat | \$2.5692 | CA 4b (Cheese Milk) Milkfat | \$3.61 |
| Cheese Yield (90% Fat Recovery, 38% Moisture) | 12.93 | CA 4b (Cheese Milk) SNF | \$0.7176 | CA 4b (Cheese Milk) SNF | \$0.56 |
| | | CA Overbase Milkfat | \$2.5520 | CA Overbase Milkfat | \$3.58 |
| CME Block Cheese Price | \$1.61 | CA Overbase SNF | \$0.7372 | CA Overbase SNF | \$0.56 |