UPPER MIDWEST MARKETING AREA

# Analysis of Component Levels and Somatic Cell Count in Individual Herd Milk at the Farm Level

## 2025

## Staff Paper 26-01


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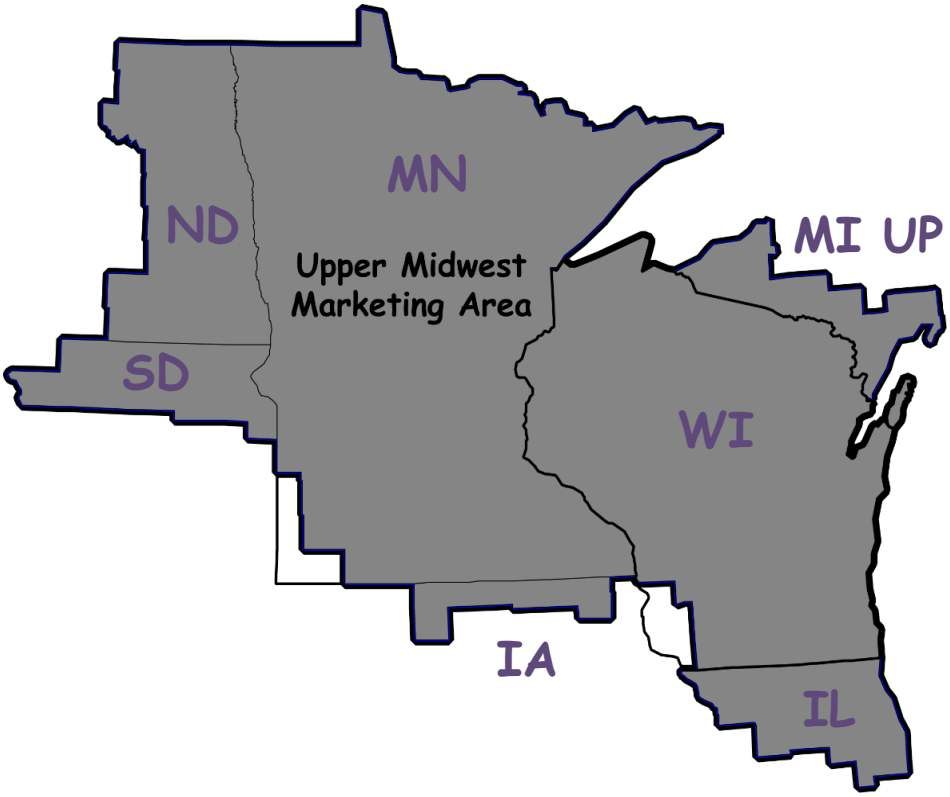


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# Analysis of Component Levels and Somatic Cell Count in Individual Herd Milk at the Farm Level

# 2025

**Areerat Kichkha** [1]

## Introduction

This study analyzes the component levels and values comprising milk production for Federal Order 30 for 2025. The payroll data for producers who were associated with the Upper Midwest Milk Marketing Order were examined. On average, 7,070 dairy producers were associated with the market every month.

The payroll data presented for this study are for those dairy farmers residing in any county in the states comprising Federal Order 30. In Michigan, only dairy farmers in the Upper Peninsula are included. The data are aggregated to the farm level which is consistent with other staff papers done by this office.

## Data and Methodology

The data used in this analysis are from monthly payroll records submitted to the Upper Midwest Order. Since handlers generally submit their entire payrolls, the data include not only producer milk pooled on the Upper Midwest, but also may include, in some cases, producer milk pooled on other orders and milk historically associated with the order but not pooled in some months because of class price relationships and prices in other Federal marketing orders. The result is a difference between the number of producers and milk production reported in this study and the number of producers and milk production reported as pooled on the Upper Midwest Order.

Also, there are a number of instances in which there are multiple cases representing producer milk from one farm. These are situations where more than one producer received a share of the milk check, or there is more than one bulk tank on the farm. For individual producers, total monthly milk marketed, component pounds and somatic cell count (SCC) from payrolls submitted to the Market Administrator's office are aggregated to the farm level for this analysis. All producer milk was included in the analysis that follows, unless otherwise noted in the text, figures, or tables.

Other solids, for purposes of Federal milk order pricing, are defined as solids-not-fat (SNF) minus protein. Therefore, other solids consist primarily of lactose and ash. Ash

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traditionally has been considered a constant in SNF, while lactose does vary somewhat in the SNF.

Many factors such as weather, feed quality and feeding practices, breed of cattle, etc., may impact component levels and relationships among components in milk. No attempt was made to estimate the specific effects of such factors on milk composition. However, average component levels were examined for seasonal or within-year variation. In addition, component levels were examined for the seven primary states that are at least partially within the milk procurement area of the Upper Midwest Order. Since the procurement area stretches from south of Chicago to northwestern North Dakota, state level component and SCC statistics provide a means of reflecting variation in milk composition across a large geographic area. Average component levels by size of producer marketings were also examined.

This paper also looks at somatic cell count data for the period 2013 to 2025. The analysis seeks to identify and quantify a possible trend in decreasing somatic cell counts. The trend component must also be separated from the cyclical component endemic to somatic cell counts.

The cumulative value of butterfat, protein and other solids, adjusted for SCC, on an annual per cwt. basis, was examined to observe how milk values varied under differing constraints. Monthly Federal order component prices that apply to the Upper Midwest Order were used to calculate milk values for this study.

## Seasonal Variation in Milk Component Levels and SCC

While widespread use of artificial insemination, freestall barns, and total mix rations have reduced production swings, seasonality is still present. Seasonal production ‘spring flush’ and the winter drop in production also lead to seasonal movements in component tests. Butterfat, protein and SNF tests generally have their lowest levels in July and peak in November. Somatic cell counts peak in the warm summer months and reach a low point in November. Other solids tests show little variation but usually peak in the spring or summer months.

Monthly weighted average component levels and SCC for 2025 are summarized in Table 1. Seasonal changes in component levels for 2025 appeared to be relatively normal. Beginning in January, butterfat, protein and SNF tests tapered off during the summer to low points in July, then rose to peak levels around December. Other solids tests peaked for the most months of late winter, spring and summer for 2025 and declined slightly after July through the remainder of the year. Meanwhile, SCC peaked in August and reached the lowest point both in December and early spring.

## *Table 1*

### Weighted Average Components Levels and Somatic Cell Count, by Month

### 2025

| Month | Butterfat | Protein | Other Solids | SNF | SCC |
|---|---|---|---|---|---|
| | - % - | - % - | - % - | - % - | - 1,000 - |
| January | 4.53 | 3.42 | 5.78 | 9.20 | 163 |
| February | 4.52 | 3.41 | **5.80** | 9.20 | 162 |
| March | 4.43 | 3.37 | **5.80** | 9.17 | **160** |
| April | 4.42 | 3.35 | 5.79 | 9.15 | **160** |
| May | 4.34 | 3.31 | **5.80** | 9.12 | 167 |
| June | 4.27 | 3.26 | 5.79 | 9.05 | 173 |
| July | **4.17** | **3.19** | **5.80** | **8.99** | 197 |
| August | 4.20 | 3.23 | 5.79 | 9.02 | **207** |
| September | 4.31 | 3.31 | 5.79 | 9.10 | 193 |
| October | 4.40 | 3.38 | 5.79 | 9.17 | 182 |
| November | 4.55 | 3.47 | **5.75** | 9.23 | 167 |
| December | **4.60** | **3.50** | 5.78 | **9.28** | **160** |
| **Annual Weighted Average** | **4.39** | **3.35** | **5.79** | **9.14** | **174** |
| **Minimum** | 4.17 | 3.19 | 5.75 | 8.99 | 160 |
| **Maximum** | 4.60 | 3.50 | 5.80 | 9.28 | 207 |

The seasonality of changes and magnitude of variation in component levels during the year were generally similar to the observed results from previous studies, though other solids tests seemed to have more months of peak times in 2025 which might still be considered normal given their low variation. Seasonal variation in the monthly average SCC in 2025 appeared to be typical with higher levels in the summer, but with slightly atypical lower levels which appeared late in the fall and early spring with the lowest point in March, April, and December of 2025.

Several miscellaneous annual statistics, in addition to weighted averages, are summarized in Table 2. The simple averages for butterfat, protein, other solids, and SNF were lower than the weighted average, indicating that larger producers (in terms of monthly milk deliveries) tended to have higher levels of these components than smaller producers.

The period from 2013 to 2025 has seen higher protein levels and overall higher component levels in the largest production group, as seen in Tables 5a and 5b for 2025. The more numerous smaller dairies have tests more likely to be around the simple average and the fewer larger dairies are biased toward the weighted average.

## *Table 2*

### Component Levels and Somatic Cell Count (SCC)

### 2025

| Component | Weighted Average | Simple Average | Weighted Standard Deviation | Simple Median | Minimum | Maximum |
|---|---|---|---|---|---|---|
| | - % - | - % - | - % - | - % - | - % - | - % - |
| Butterfat | 4.39 | 4.23 | 0.38 | 4.22 | 2.51 | 6.92 |
| Protein | 3.35 | 3.26 | 0.23 | 3.24 | 2.00 | 6.51 |
| Other Solids | 5.79 | 5.73 | 0.09 | 5.75 | 3.04 | 6.90 |
| SNF | 9.14 | 8.98 | 0.24 | 9.00 | 5.19 | 12.58 |
| SCC (per 1,000) | 174 | 220 | 85 | 197 | 13 | 1372 |

The simple average SCC of 220,000 was higher than the weighted average of 174,000, indicating that larger producers on average tended to have lower SCC than their smaller counterparts. Moreover, the simple median SCC level of 197,000 was also lower than the simple average, indicating that the distribution of SCC levels for the market was skewed toward higher levels. A more detailed breakdown of that skewness is presented in Tables 3a and 3b. The data for Tables 3a and 3b are from producers for which we have data for all 12 months during the year.

The overall distributions for butterfat, protein, and SNF tests are all approximately normal, with other solids and SCC being skewed. Somatic cell counts are skewed right with a large number of observations at lower levels and fewer large values, i.e. 80.25% of the farms have a higher SCC than the weighted average SCC, shown on Tables 5a and 5b. The lower SCC of the larger producers drags down the weighted average.

The ranges of most component levels observed in the data were fairly wide. While the range of other solids tests was slightly smaller than in the preceding year, the ranges of butterfat, protein, SNF and SCC were wider. Average individual producer butterfat levels in the data ranged from 2.51% to 6.92%; protein levels from 2.00% to 6.51%; other solids levels from 3.04% to 6.90%; SNF levels from 5.19% to 12.58%; and SCC from 13,000 to 1,372,000. See Table 2.

However, during the year, the monthly component tests and SCC levels in most producer milk were within one standard deviation of the weighted average. As shown in Table 1, the ranges of component levels within one standard deviation of the weighted average were: 4.01% - 4.77% for butterfat; 3.12% - 3.58% for protein; 5.70% - 5.88% for other solids; 8.90% - 9.38% for SNF; and 89,000 - 259,000 for SCC. Meanwhile, approximately three-quarters or more of the observed component levels and SCC in the 2025 data were within one simple standard deviation of the simple average ranges.

The differences in the weighted and simple averages and the simple medians of the component tests warrant a closer look at the relationship between farm size, based on monthly average milk marketed, and milk component levels. Producers with marketings for each month of 2025 were divided into ten percentiles, ten groups with the same number of producers, based on average monthly production. The monthly average production and component tests are shown in Table 3a. The range of average monthly production and total production by group are shown in Table 3b.

A more detailed look at the relationship between producer size and component levels shows that butterfat tests were lowest in the smallest group of producers (4.16% in group 1) and increased as the group sizes increased (4.44% in group 10), a similar pattern to 2024, but different from 2021 – 2023 when butterfat levels were lowest in the middle groups of producers but higher for both the smallest and largest size groups, and from prior to 2021 when the tests dropped as the average size of the producer increased.

Protein tests fell from 3.24% in Group 1 to 3.23% in Groups 2 - 5 but rose to 3.38% in Group 10, similar pattern to years 2021 – 2024 but different from the years prior when the tests dropped as the average size of the producer increased.

## *Table 3a*

## Weighted Average Components by Monthly Average Producer Milk for Producers with Production in Each Month

## 2025

| Percentile Group | Number of Producers | Butterfat | Protein | Other Solids | SNF | SCC |
|---|---|---|---|---|---|---|
| | | - % - | - % - | - % - | - % - | - 1,000 - |
| 1 | 560 | 4.16 | 3.24 | 5.60 | 8.84 | 285 |
| 2 | 560 | 4.17 | 3.23 | 5.66 | 8.89 | 257 |
| 3 | 560 | 4.17 | 3.23 | 5.70 | 8.93 | 252 |
| 4 | 560 | 4.18 | 3.23 | 5.73 | 8.96 | 232 |
| 5 | 560 | 4.19 | 3.23 | 5.74 | 8.97 | 212 |
| 6 | 560 | 4.21 | 3.24 | 5.75 | 8.99 | 196 |
| 7 | 560 | 4.25 | 3.26 | 5.76 | 9.02 | 194 |
| 8 | 560 | 4.28 | 3.27 | 5.78 | 9.05 | 185 |
| 9 | 560 | 4.30 | 3.27 | 5.80 | 9.07 | 165 |
| 10 | 560 | 4.44 | 3.38 | 5.80 | 9.18 | 166 |
| **Total** | **5599** | **4.37** | **3.33** | **5.79** | **9.12** | **174** |

## *Table 3b*

## Monthly Average Producer Milk by Producer Size for Producers with Production in Each Month

## 2025

| Percentile Group | Monthly Average Pounds | Minimum Monthly Average Pounds | Maximum Monthly Average Pounds | Total Pounds | Percentage of Total Pounds | Cumulative Percentage of Total Pounds |
|---|---|---|---|---|---|---|
| 1 | 25,192 | 1080 | 39,065 | 169,262,663 | 0.42 | 0.42 |
| 2 | 51,231 | 39,065 | 63,199 | 344,270,729 | 0.84 | 1.26 |
| 3 | 75,454 | 63,203 | 88,001 | 506,294,325 | 1.24 | 2.50 |
| 4 | 101,702 | 88,007 | 115,957 | 684,350,828 | 1.68 | 4.18 |
| 5 | 132,479 | 115,957 | 151,544 | 890,126,465 | 2.18 | 6.36 |
| 6 | 177,110 | 151,545 | 208,657 | 1,190,000,789 | 2.92 | 9.28 |
| 7 | 260,140 | 208,692 | 325,752 | 1,747,879,697 | 4.29 | 13.57 |
| 8 | 448,738 | 325,777 | 606,039 | 3,015,070,083 | 7.39 | 20.96 |
| 9 | 918,555 | 606,040 | 1,396,236 | 6,171,768,332 | 15.13 | 36.19 |
| 10 | 3,878,536 | 1,397,197 | 21,740,340 | 26,063,762,829 | 63.61 | 100.00 |
| **Market Total** | **606,950** | **1080** | **21,740,340** | **40,782,786,740** | | |

The SCC declined steadily as producers increased in size, though slightly increased again from group 9 to 10 in 2025. The resulting difference in the SCC of 120,000 ranged from producers of an average of 25,192 pounds per month with an average SCC of 285,000 in group 1 to producers of an average of 918,555 pounds per month with an average SCC of 165,000 in group 9.

Other solids and SNF tests steadily increased as average monthly production increased. Other solids tests increased from 5.60% to 5.80% from the smallest to the largest group, while SNF tests increased from 8.84% to 9.18% from the smallest to the largest group.

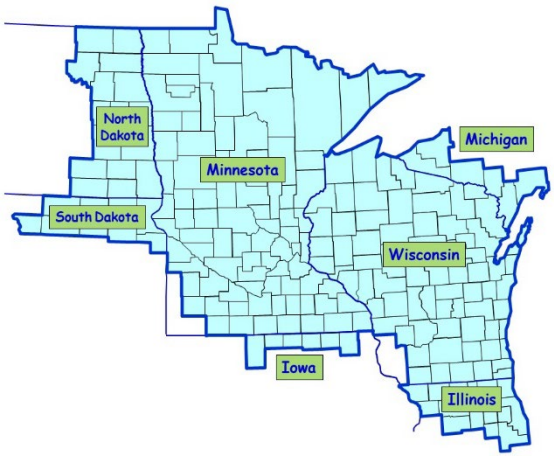
The data from Tables 3a and 3b also offer some interesting insight into the structure of the market. For instance, the two smallest ten percentile groups of producers supply less than two percent of the milk, while the largest ten percent of producers supply nearly 64 percent of the milk in the market. Approximately 80 percent of producers have monthly production below the monthly average market production of 606,950 pounds.

## Variations in Component Levels and SCC Within the Marketing Area

Milk component levels and SCC were examined for the seven states that have counties within the Upper Midwest Marketing Area (see Table 4). Differences in average component levels and SCC between the states were observed. One-way analysis of variance was used to determine that the weighted averages of the states were not equal. In addition, several post hoc paired tests were conducted to determine if any of the individual states' weighted averages were equal. These tests indicated that even though the observed differences between some of the states were relatively small, the differences between the weighted averages were significant.

***Figure 1***

**Upper Midwest Marketing Area**



## *Table 4*

### Weighted Average Component Levels and SCC by State

### 2025

| State | Butterfat | Protein | Other Solids | SNF | SCC |
|---|---|---|---|---|---|
| | - % - | - % - | - % - | - % - | - 1,000 - |
| Illinois | 4.17 | 3.25 | 5.79 | 9.05 | 183 |
| Iowa | 4.47 | 3.41 | 5.79 | 9.20 | 207 |
| Michigan UP | 4.23 | 3.24 | **5.80** | 9.03 | **240** |
| Minnesota | 4.52 | 3.42 | 5.76 | 9.18 | 182 |
| North Dakota | 4.27 | 3.33 | 5.77 | 9.10 | 220 |
| South Dakota | **4.60** | **3.55** | 5.79 | **9.34** | 183 |
| Wisconsin | 4.32 | 3.29 | **5.80** | 9.09 | 165 |
| **Market Total** | **4.39** | **3.35** | **5.79** | **9.14** | **174** |
| Minimum | 4.17 | 3.24 | 5.76 | 9.03 | 165 |
| Maximum | 4.60 | 3.55 | 5.80 | 9.34 | 240 |

Of the states that are wholly or partially located in the Upper Midwest Marketing Area, South Dakota had most of the highest weighted average component tests while Michigan UP had the highest Other Solids tests. Wisconsin had the lowest weighted average SCC and Michigan UP had the highest.

Tables 5a and 5b use a scale of production employed by the Upper Midwest Milk Order to illustrate differences present over production ranges from less than 50,000 pounds to over 5,000,000 pounds. Table 5a shows that component tests tend to increase, but SCC tends to decline, as scale increases. None of the trends are monotonic, though they are more monotonic than previous years. The largest scale of production, 5,000,000 pounds or more, has a substantial increase in butterfat, protein and SNF tests over the second next smaller size range. However, patterns in the other solids and SCC size ranges are not very evident. Table 5a indicates the average monthly production for the largest range is more than two and two-thirds times as much as the second largest size range. Table 5b also shows that the largest size category produces 35% of total production.

## *Table 5a*
## Weighted Average Components by Size Range of Monthly Average Producer Milk
### All Producers -- 2025

| Size Range Categories *(Pounds)* | Monthly Average Pounds | Butterfat | Protein | Other Solids | SNF | SCC |
|---|---|---|---|---|---|---|
| | | - % - | - % - | - % - | - % - | - 1,000 - |
| Up to 49,999 | 30,266.32 | 4.17 | 3.24 | 5.62 | 8.86 | 279 |
| 50,000 to 99,999 | 74,282.08 | 4.18 | 3.24 | 5.70 | 8.94 | 250 |
| 100,000 to 249,999 | 157,466.21 | 4.21 | 3.24 | 5.74 | 8.99 | 206 |
| 250,000 to 399,999 | 314,438.86 | 4.26 | 3.26 | 5.77 | 9.04 | 193 |
| 400,000 to 599,999 | 492,300.53 | 4.29 | 3.27 | 5.78 | 9.05 | 183 |
| 600,000 to 999,999 | 766,267.84 | 4.29 | 3.27 | 5.80 | 9.07 | 174 |
| 1,000,000 to 1,499,999 | 1,228,860.48 | 4.31 | 3.27 | 5.80 | 9.07 | 161 |
| 1,500,000 to 2,499,999 | 1,937,733.68 | 4.35 | 3.30 | 5.81 | 9.11 | 156 |
| 2,500,000 to 4,999,999 | 3,503,790.64 | 4.39 | 3.33 | 5.81 | 9.14 | 169 |
| 5,000,000 or more | 9,366,484.86 | 4.54 | 3.46 | 5.79 | 9.25 | 169 |
| **Average** | **627,699.35** | **4.39** | **3.35** | **5.79** | **9.14** | **174** |

## *Table 5b*
## Monthly Average Producer Milk by Producer Size Range
### All Producers -- 2025

| Size Range Categories *(Pounds)* | Number of Observations | Minimum Monthly Average Pounds | Maximum Monthly Average Pounds | Percentage of Total Pounds | Cumulative Percentage of Total |
|---|---|---|---|---|---|
| Up to 49,999 | 12,747 | 222 | 49,999 | 0.72% | 0.72% |
| 50,000 to 99,999 | 16,774 | 50,003 | 99,999 | 2.34% | 3.06% |
| 100,000 to 249,999 | 25,241 | 100,001 | 249,975 | 7.46% | 10.53% |
| 250,000 to 399,999 | 7,944 | 250,010 | 399,968 | 4.69% | 15.22% |
| 400,000 to 599,999 | 5,373 | 400,030 | 599,982 | 4.97% | 20.19% |
| 600,000 to 999,999 | 5,433 | 600,014 | 999,776 | 7.82% | 28.00% |
| 1,000,000 to 1,499,999 | 3,411 | 1,000,220 | 1,499,889 | 7.87% | 35.88% |
| 1,500,000 to 2,499,999 | 3,351 | 1,500,003 | 2,499,707 | 12.19% | 48.07% |
| 2,500,000 to 4,999,999 | 2,573 | 2,500,627 | 4,998,526 | 16.93% | 65.00% |
| 5,000,000 or more | 1,990 | 5,004,990 | 30,281,569 | 35.00% | 100.00% |
| **Total** | **84,837** | **222** | **30,281,569** | | |

## Component Values Under the Upper Midwest Order

Multiple component pricing on the Upper Midwest Order allows for component levels to be viewed in terms of the value of producer milk given its composition. Milk values, for the purpose of this study, were calculated on an annual basis using monthly Federal order component prices applied to producer milk associated with the Upper Midwest Order during 2025. These values reflect the aggregated value of butterfat, protein and other solids only. These values do not include monthly producer price differentials for the Upper Midwest Order, or premiums and/or deductions that handlers pooling milk under the order may apply to producer pay prices.

As observed in Table 6 the cumulative value of butterfat, protein, and other solids, with an adjustment for SCC, averaged $21.18 per cwt. for the market for 2025.

***Table 6***

**Component Values in Producer Milk**

**2025**

| | Component | | | | |
|---|---|---|---|---|---|
| | Butterfat | Protein | Other Solids | Somatic Cell Count | Total Value |
| **Value** (per cwt.) | $10.70 | $8.21 | $2.12 | $0.16 | **$21.18** |
| **Percentage** | 50.49 | 38.76 | 10.02 | 0.73 | **100.00%** |

Categorized by size range of delivery in Table 7, average values of producer milk ranged from a low of $20.24 per cwt. for monthly producer milk deliveries of less than 50,000 pounds to a high of $21.78 per cwt. for monthly producer milk deliveries of 5,000,000 or more. Historically, this relationship between value per cwt. and production has been inversely related with the producers in the 5,000,000 pound or more range having increased value over the next largest category since 2010. These results correspond well to comparisons between simple and weighted average component levels in the section of this paper beginning at the bottom of Page 2.

## *Table 7*

## Aggregated Component Values by Size Range of Monthly Producer Milk

## 2025

| Size Range Categories (Pounds) | Aggregated Component Values * | Producer Milk | Weighted Average Value |
|---|---|---|---|
| | (Dollars) | (Pounds) | ($/cwt.) |
| Up to 49,999 | 78,072,650.80 | 385,804,725 | 20.24 |
| 50,000 to 99,999 | 253,527,268.24 | 1,246,007,569 | 20.35 |
| 100,000 to 249,999 | 814,122,583.74 | 3,974,604,706 | 20.48 |
| 250,000 to 399,999 | 515,821,190.19 | 2,497,902,337 | 20.65 |
| 400,000 to 599,999 | 549,877,272.90 | 2,645,130,774 | 20.79 |
| 600,000 to 999,999 | 865,117,453.44 | 4,163,133,160 | 20.78 |
| 1,000,000 to 1,499,999 | 873,437,556.90 | 4,191,643,083 | 20.84 |
| 1,500,000 to 2,499,999 | 1,365,092,853.34 | 6,493,345,577 | 21.02 |
| 2,500,000 to 4,999,999 | 1,906,511,369.93 | 9,015,253,318 | 21.15 |
| 5,000,000 or more | 4,059,239,263.48 | 18,639,304,865 | 21.78 |
| **Total** | **11,280,819,462.95** | **53,252,130,114** | **21.18** |

* Total value of pounds of butterfat, protein, and other solids, adjusted for SCC.

## Component Value in 2025

Table 8 contains the component prices announced by Federal orders for 2025. Table 7 indicates the overall component value for each size category using Table 8 prices and Upper Midwest producer data. Table 6 shows the breakdown by component on a per cwt. basis for overall milk value. Butterfat and protein contribute the vast majority of the milk's value with 89.25%, while other solids and the somatic cell value contribute 10.75%.

### *Table 8*

### Monthly Component Prices and Somatic Cell Adjustment Rate for the Upper Midwest Order Producers

### 2025

| Month | Butterfat Price | Protein Price | Other Solids Price | Somatic Cell Adjustment Rate |
|---|---|---|---|---|
| | *Dollars per Pound* | | | *Dollars per cwt. per 1,000 SCC* |
| January | 2.9460 | 2.3267 | 0.5384 | 0.00094 |
| February | 2.8186 | 2.5337 | 0.4799 | 0.00095 |
| March | 2.6242 | 2.4606 | 0.3647 | 0.00091 |
| April | 2.6406 | 2.1682 | 0.3087 | 0.00087 |
| May | 2.6627 | 2.4810 | 0.3222 | 0.00092 |
| June | 2.7378 | 2.5328 | 0.2914 | 0.00097 |
| July | 2.8435 | 1.8730 | 0.3092 | 0.00088 |
| August | 2.7255 | 1.9646 | 0.3204 | 0.00088 |
| September | 2.1925 | 2.7062 | 0.3207 | 0.00090 |
| October | 1.8252 | 2.8761 | 0.3360 | 0.00087 |
| November | 1.7061 | 3.0143 | 0.3859 | 0.00087 |
| December | 1.5761 | 2.4563 | 0.4352 | 0.00076 |
| **Simple Average** | **2.4416** | **2.4495** | **0.3677** | **0.00089** |

## Trends in Somatic Cell Counts Under the Upper Midwest Order

The data in Table 9 shows that the weighted average SCC and the weighted standard deviation in SCC data on the Upper Midwest Order has fallen over time and become steadily low in the past four years. In addition, this trend means, in general, that the average has fallen, and the distribution has tightened up around that average from 2013 to 2025.

***Table 9***

**Weighted Average Somatic Cell Count in Milk**

**2013 to 2025**

| Year | Weighted Average Somatic Cell Count | Weighted Standard Deviation |
|---|---|---|
| | -1,000- | -1,000- |
| 2013 | 224 | 100 |
| 2014 | 222 | 104 |
| 2015 | 208 | 94 |
| 2016 | 211 | 98 |
| 2017 | 198 | 93 |
| 2018 | 182 | 89 |
| 2019 | 179 | 88 |
| 2020 | 177 | 82 |
| 2021 | 182 | 88 |
| 2022 | 179 | 83 |
| 2023 | 178 | 82 |
| 2024 | 177 | 83 |
| 2025 | 174 | 85 |

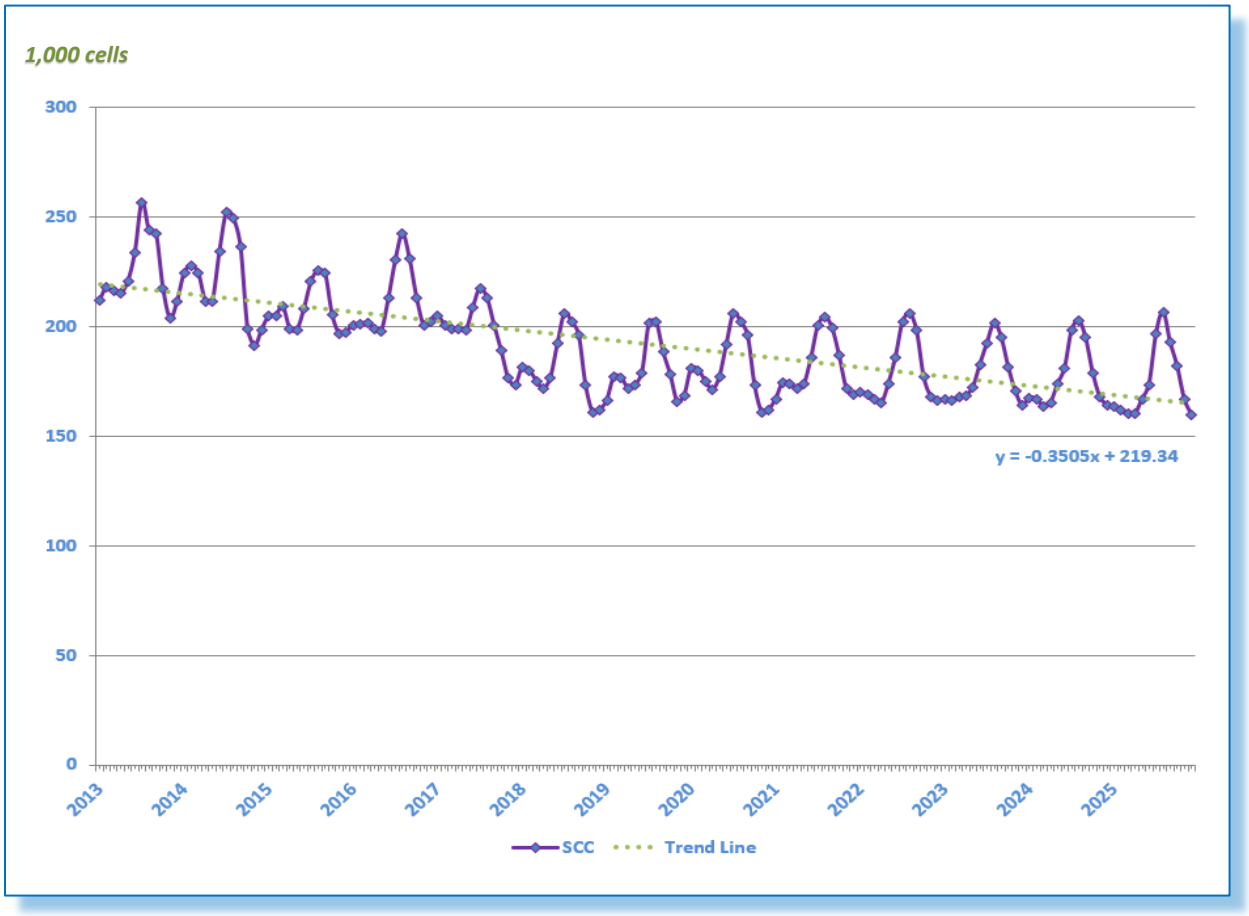
Figure 2 indicates that in addition to a downward sloped trend line, the effect of the trend is greater than the normal seasonal shifts in monthly SCC. The herd milk from producers in recent years has a seasonal high SCC, usually in mid or late summer, that no longer rises to the winter lows of earlier years. The seasonal highs since 2019 are below the seasonal low for 2013. A trend line fitted to the 2025 data shows a downward slope of -0.3505 times the average. That is, after a hundred observations or months,

the average cell count falls by 35.05 1,000s of cells per milliliter from January 2013 to December 2025. This trendline is flatter than the trendlines which include 2010, 2011 and/or 2012 data as seen in these component series papers in the past three years. Hence, the weighted average SCC and weighted standard deviation in the SCC data had become steadier.

***Figure 2***

**Weighted Average Somatic Cell Count by Month**

**2013 to 2025**

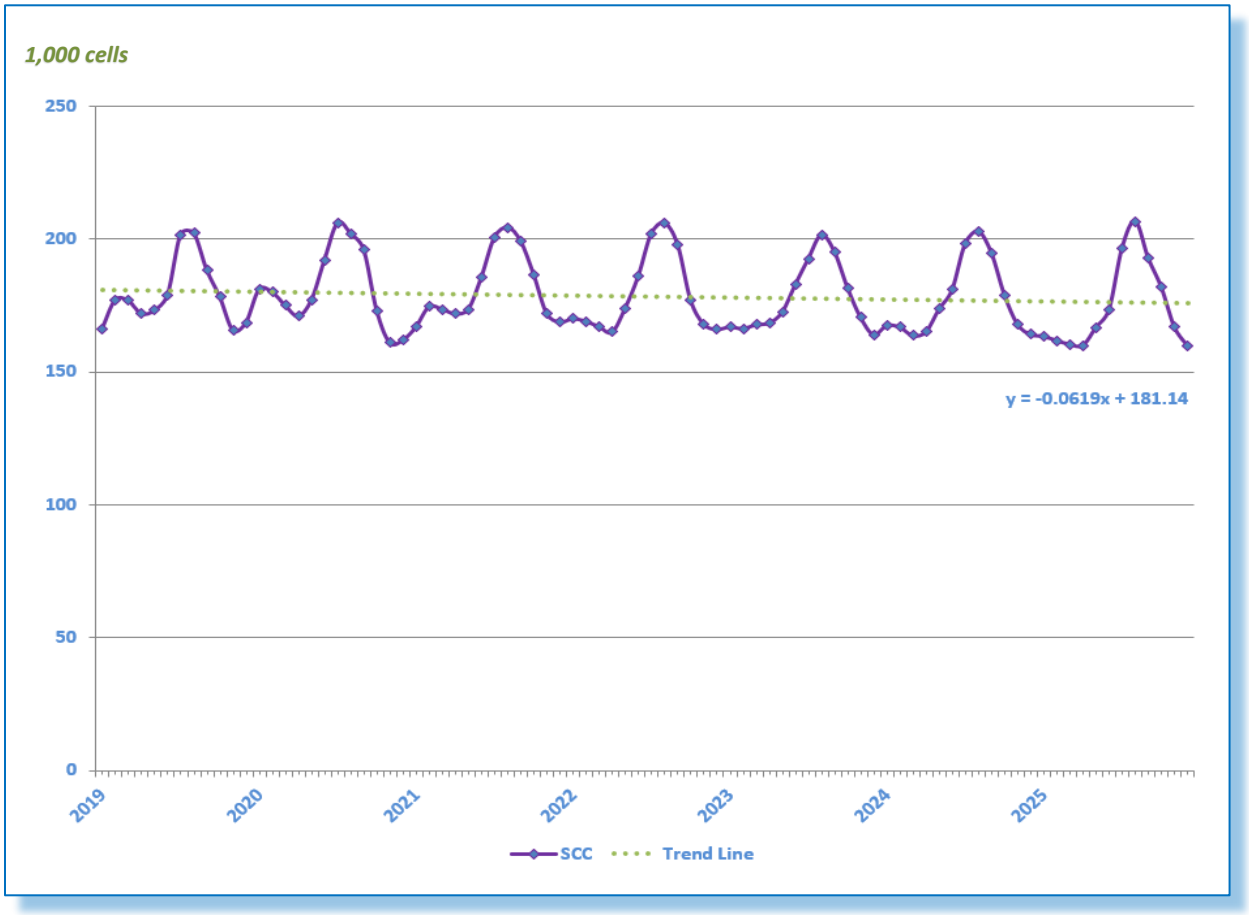



Somatic cell counts under the Upper Midwest Order also have shown steady distribution around the mean since 2019 as they have reached a no-trend state. As seen in Figure 3, a trend line fitted to the data shows an almost flat line with a slope of -0.0619 times the average, i.e. the average of somatic cell counts decreases by 6.19 1,000s of cells per milliliter from January 2019 to December 2025. This disappearing trend suggests that SCC sustain a stationary state with more consistent predicted values over time.

***Figure 3***

**Weighted Average Somatic Cell Count by Month**

**2019 to 2025**




## Summary

The producer payroll data for Federal Order 30 is characterized by seasonality, roughly normal distributions, and a pronounced skewness in number of producers by size. Seasonally, SCC increase in the summer months as the other tests are decreasing. The SCC are also distributed with a skewness to higher values and a median value lower than the simple average SCC. The producer data has a large number of farms producing a relatively small proportion of total milk. The component tests, including SCC, for these small farms have been historically higher. Historically, as a consequence of this skewness, the cwt. component value of the milk is also higher for smaller farms. A recent break from historical trends, started in 2022, is that the largest categories of dairies have higher component tests and milk value.

Smaller producers, based on average monthly milk marketed in 2025, still had high protein tests, but these were no longer the highest tests. They did still have highest SCC values compared to larger producers. Meanwhile, larger producers had higher butterfat tests, protein tests, other solids and SNF tests compared to smaller producers.

The smallest producers marketed less than 1 percent of the milk while the largest producers, those over 1,500,000 pounds, produced over 64 percent of all the milk. The monthly average pounds of milk marketed were 627,699 pounds, however, more than 80 percent of the producers had production below the market average.

Somatic cell counts under the Upper Midwest Order have shown a sustained and substantial downward trend from 2013 through 2025. This trend has coincided with a tightening of the distribution of SCC about the mean, i.e., the trend is disappearing.

Under multiple component pricing, the annual weighted average value of butterfat, protein, and other solids, adjusted for SCC, was $21.18 per cwt. for the market. Butterfat and protein contribute most of the milk's value with other solids and SCC contribution of 10.75% of the total value.

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