
Farm Business Management

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**Component production per cow per day:
Ranges and selected measures**

Dairy Profit Monitor, September 2022 to August 2023

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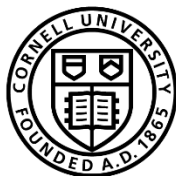
Milk component yield has become a key management focus for dairy farms over the last two decades. The combination of the impact that components have on milk pricing and two-tier milk pricing programs have been driving this focus.

Pounds of components refers to the combined sum of butterfat and protein shipped per cow per day. It is a product of a farm's butterfat and protein percentage in their milk, as well as total pounds produced per cow per day. Strategies to increase efficiency and herd component yield differ from farm to farm. Today, some farms aim to ship more fluid pounds overall to push component pounds higher. However, for farms that cannot ship more fluid milk, they are pursuing other strategies that might improve butterfat and protein percentages.

Using data from the Dairy Profit Monitor for the period of August 2022 to September 2023, herd performance metrics over 12-months from 110 farms were used to create five performance groups with 22 farms in each quintile. The pounds of components per cow per day were used to sort herd performance measures, with the highest quintile of data being the highest component herds. With the focus on pounds of components, these farms were strictly Holstein herds to eliminate outliers due to breed. The average pounds of components per cow per day and selected measures by quintile are in Table 1. Quartile 5 represents the highest performance group in pounds of components, while Quartile 1 represents the lowest of the range.

The average pounds of components per cow per day for the lowest quintile was 5.51, 6.02 for the second quintile, 6.27 in the third quintile, 6.51 in the fourth quintile, and 6.96 in the top quintile. The highest component herds had the highest percent fat and protein, lowest somatic cell, and were the highest for milk yield. In other areas, these same herds had the highest pregnancy rate at 31 percent, while the lowest component herds had the lowest pregnancy rate at 25 percent. Cull rate and days in milk did not have a clear trend, though the highest quintile for components had the lowest cull rate at 31 percent.

As component yield increased among herds, so did dry matter (DM) fed. The lowest quintile component herds averaged 54.0 pounds DM fed while the highest component herds averaged 58.5 pounds of DM fed. There was no clear trend when looking at percent forage in the diet among quintiles, with the two lowest component quintiles representing the highest and lowest



percent forage fed. Forage digestibility likely plays a significant role in this outcome and that is unrelated to the amount of forage fed. Feed conversion, however, showed a positive relationship between component production and efficiency and this is consistent with differences in forage digestibility. As digestibility increases, DM intake potential increases as does energy and microbial protein yield. As components per cow increased, so did pounds of energy corrected milk (ECM) per pound of DM. The top quintile of farms averaged 1.74 pounds of ECM per pound of DM fed, with the lowest quintile at 1.52 pounds.

TABLE 1

**Component Production per Cow and Selected Measures
Sorted by Components per Cow per Day, 110 Holsteins Herds
Dairy Profit Monitor, September 2022 - July 2023**

	Quintile 5	4	3	2	Quintile 1
Lbs. comp./cow/day	6.96	6.51	6.27	6.02	5.51
% Fat	4.23	4.12	4.11	4.08	4.00
% Protein	3.26	3.20	3.17	3.20	3.16
SCC	128,377	135,757	147,380	160,312	192,774
Milk per cow per day	93.1	89.0	86.0	82.8	77.1
ECM Milk/cow/day	102.1	96.0	92.6	88.9	81.7
Milk sold Per Worker	1,658,308	1,445,403	1,447,884	1,441,347	1,354,819
Preg Rate	31.4	27.1	28.3	27.9	25.2
Cull Rate	30.9	33.8	34.4	36.1	33.8
Herd DIM	167.8	166.8	166.5	170.8	175.0
DM Fed per Cow	58.8	57.0	56.7	55.7	54.0
Percent Forage in Diet (DM Basis)	56.5	57.9	57.9	55.5	58.4
Lbs. of ECM per lb. of Dry Matter	1.74	1.69	1.64	1.60	1.52
NMIOTFC (lactating, fixed milk)	10.94	9.93	9.47	8.96	8.14

The same relationship is seen with net milk income over total feed cost. Higher component producing herds had higher net milk income over total feed costs and this trend can be seen as components increases across groups. The group lowest in components saw an average net milk income over total feed cost of \$8.14, the second quintile was \$8.96, the third was \$9.47, the fourth was \$9.93, and the top component herds had an average of \$10.94 net milk income over feed cost. Some relationships can be seen between factors of production and herd component production.

Selected data for each performance group from Table 1 was further broken down to look at the range of values within each component group, found in Table 2. For each group, data was first sorted in descending order for each metric, followed by calculating averages by quartile of data within those same 22 farms. With this approach, each column of data is independent from others. Looking at the expanded data allows for further examination of relationships between herd management areas and component production.

There are some metrics for which ranges in lower quintiles overlap or are like those in higher component groups. This is the case in some instances for percent butterfat and protein. Though some of these herds are higher in fat and protein on average percentage wise, the highest performing group of farms had the highest milk production per cow on average. This can be seen moving from quintile one to quintile five. The top quintile of farms averaged 88.8 to 97.8 pounds per cow per day. The bottom quintile on the other end of the range averaged 72.1 to a high of 80.6 pounds per cow per day. Somatic cell count, as well as other management areas, including pregnancy rate, cull rate, DM fed per cow per day, and percent forage do not always exhibit higher ranges of performance in the top quintile.

In the area of feed conversion, the top quintile of herds in component performance also averaged the highest pounds of ECM per pound of DM. In quintile five feed conversion ranged from an average of 1.62 to 1.76. Comparatively, the bottom quintile of farms had a feed conversion ranging from an average of 1.40 to 1.61. Generally, average pounds of ECM per pound of DM increased from the bottom to top production group. A similar trend can be seen when looking at net milk income over total feed cost. This metric uses a fixed milk price to remove any variation between farms based on where their milk is shipped. The highest group of farms in components achieved the highest net milk income on average. While the range of values for each quintile does show some overlap among the second, third, and fourth quintiles, the lowest value in the top component group is higher than the highest value in the lowest group.

On average, as components per cow per day increases, so does net milk income feed costs using fixed milk prices. Higher component herds have higher feed conversion, higher pregnancy rates, lower somatic cell counts, and lower cull rates. A combination of the percent of components and milk production lead to the high component production, with farms achieving high component production with different levels of percent components and milk production. Monitoring a variety of farm performance metrics can be an important tool in managing to meet production goals in dairy herds.

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TABLE 2. Herd management chart by quintile of component production
Each column sorted independently
Dairy Profit Monitor, 110 Holstein herds, September 2022 to August 2023

Top Quintile

Lbs components per cow per day	% Fat	% Protein	Milk per cow per day	Somatic Cell Count	Preg Rate	Cull Rate	Lbs. of ECM per lb. of Dry Matter	Dry Matter Fed per Cow per Day	Percent Forage in Diet	NMIOTFC (lactating, fixed milk price)
7.29	4.41	3.39	97.8	87,498	37	37	1.81	61.4	61.3	11.89
6.98	4.25	3.26	93.5	108,713	32	32	1.75	59.7	56.9	11.01
6.83	4.18	3.22	92.2	136,067	30	29	1.73	58.0	55.4	10.77
6.73	4.07	3.16	88.8	179,236	26	25	1.67	56.2	52.4	10.07

Quintile 4

Lbs components per cow per day	% Fat	% Protein	Milk per cow per day	Somatic Cell Count	Preg Rate	Cull Rate	Lbs. of ECM per lb. of Dry Matter	Dry Matter Fed per Cow per Day	Percent Forage in Diet	NMIOTFC (lactating, fixed milk price)
6.63	4.29	3.25	91.7	90,861	32	41	1.76	59.4	63.0	10.64
6.55	4.15	3.21	89.2	110,163	28	35	1.70	57.9	59.2	10.11
6.46	4.06	3.20	88.2	127,462	26	32	1.67	56.3	56.8	9.70
6.39	3.97	3.15	86.8	208,894	23	27	1.62	54.4	52.7	9.26

Quintile 3

Lbs components per cow per day	% Fat	% Protein	Milk per cow per day	Somatic Cell Count	Preg Rate	Cull Rate	Lbs. of ECM per lb. of Dry Matter	Dry Matter Fed per Cow per Day	Percent Forage in Diet	NMIOTFC (lactating, fixed milk price)
6.32	4.25	3.24	88.9	107,582	33	41	1.70	59.0	61.8	9.84
6.28	4.14	3.20	86.2	137,180	29	37	1.64	56.8	59.2	9.61
6.25	4.08	3.17	85.1	153,525	27	32	1.62	56.3	57.5	9.38
6.21	3.98	3.09	83.9	190,558	24	28	1.58	54.6	53.4	9.06

Quintile 2

Lbs components per cow per day	% Fat	% Protein	Milk per cow per day	Somatic Cell Count	Preg Rate	Cull Rate	Lbs. of ECM per lb. of Dry Matter	Dry Matter Fed per Cow per Day	Percent Forage in Diet	NMIOTFC (lactating, fixed milk price)
6.14	4.37	3.33	86.5	108,500	33	42	1.65	58.5	61.1	9.92
6.08	4.10	3.22	84.3	141,133	29	38	1.61	56.3	56.4	9.05
5.98	4.00	3.17	82.6	161,855	26	34	1.59	54.9	54.3	8.72
5.90	3.85	3.10	78.1	226,820	23	30	1.53	53.2	50.0	8.12

Lowest Quintile

Lbs components per cow per day	% Fat	% Protein	Milk per cow per day	Somatic Cell Count	Preg Rate	Cull Rate	Lbs. of ECM per lb. of Dry Matter	Dry Matter Fed per Cow per Day	Percent Forage in Diet	NMIOTFC (lactating, fixed milk price)
5.78	4.15	3.24	80.6	122,675	31	42	1.61	64.9	57.0	9.36
5.62	4.04	3.18	78.5	174,605	26	34	1.55	58.4	54.0	8.66
5.46	3.94	3.15	77.4	213,886	24	31	1.52	56.5	53.1	7.94
5.21	3.85	3.09	72.1	260,420	20	28	1.40	53.6	51.6	6.67