Milking records – Making sense of it all

David A. Reid, *DVM*

Rocky Ridge Dairy Consulting, LLC, Hazel Green, WI 53811

Abstract

More veterinarians should be involved in milk quality monitoring on a regular basis. There is a need for more monitoring, training, and record evaluation on a set schedule to improve the overall milk quality on many dairies. Understanding the available data and the importance of monitoring current performance levels, as either management or equipment settings are adjusted, is important for overall profitability of the dairy. A review of some available data will be presented to aid to improving veterinary involvement in milk quality programs.

Key words: dairy, milk quality, records

Résumé

Plus de vétérinaires devraient être impliqués de façon routinière dans les programmes de surveillance de la qualité du lait. Il existe un besoin pour plus de surveillance, de formation et d'évaluation des relevés sur une base régulière pour améliorer dans son ensemble la qualité du lait dans plusieurs fermes laitières. Bien comprendre les données disponibles et le rôle de la surveillance du rendement actuel, lorsqu'il y a des ajustements au niveau de la régie ou du réglage de l'équipement, est important pour la rentabilité globale de la ferme laitière. Nous présentons un survol de certaines données afin de faciliter l'implication des vétérinaires dans les programmes de qualité du lait.

Introduction

Installation of milk meters, especially in larger dairies, allows management the flexibility to monitor the cows, people, and milking equipment on a milking-by-milking basis. I'm frequently asked what are "the" goals for some parameters typically monitored by herd managers and their veterinarians. My response is always that the most important numbers are where the dairy is today, and what happens to these same numbers as changes in either management or equipment settings are implemented on the dairy. A review of 3X parlor summaries was presented at the 2013 National Mastitis Countil (NMC) annual meeting by Brandon Treichler, and he concluded that "average flow rate, average milking duration, 2-minute milk yield, % of time units were attached, and either cows/stall/hour or milk/stall/hour offer the most potential for dairies to monitor their performance and for the industry to evaluate that performance achievement."[1] The most important action is to communicate to the milk harvest technicians after every milking, or at least daily, what their numbers were for that particular milking or day.

Monitoring milk quality also involves evaluating clinical rates of mastitis. Accurate data entry is essential for evaluation. Classifications and codes will vary by region, but individual practitioners should coordinate classifications and codes for easier herd-to-herd comparisons in their practice area. Graphically displaying the data for clinical mastitis rates can be used as a motivational tool for employees on the dairy.

Parlor Performance Numbers

Most, if not all, significant parlor performance indicators are influenced by a combination of overall cow handling and udder preparation procedures and routines employed on the dairy. If cow handling is an issue, either when moving cows to the holding pen or by the technicians in the parlor, parlor performance numbers will be lower, regardless of the quality of the udder prep and routine being followed in the parlor. Dairy stockmanship is a key component of overall parlor efficiency and profitability of individual dairy operations.

Calculating parlor performance indicators include:

1. Average milk flow is calculated by dividing the milk per cow by the average duration. Average milk flow should be at least 6.5 lb (2.9 kg) per minute for 3X herds and at least 8.5 lb (3.8 kg) for 2X herds.
2. The average milking duration should be 4 minutes or less for the first 25 lb (11.4 kg) of milk produced at a milking. For each additional 10 lb (4.5 kg) of milk, the average duration should be 0.5 minutes or less. For example, a cow giving 35 lb (15.9 kg) of milk should have an average milking duration of 4.5 minutes or less.
3. Two-minute milk yield for 3X herds should be a minimum of 14.5 lb (6.6 kg) per minute, and for 2X herds should be 18.5 lb (8.4 kg) per minute rate.
4. Percentage of time the units are attached is controlled by the number of milk-harvest technicians, size of the parlor, and the procedures and routine being followed in the parlor. The overall goal is to have consistency from shift to shift and milking to milking, because this monitor is controlled by the people in the parlor.

5. Cows per stall per hour is a monitor that can be used in any parlor, even those without automation. The goal with full udder prep for a 3X herd is to have a minimum of 4.7 turns per hour. Some elite 3X dairies will see 5 or more turns on a continuing basis, and periodically have some as high as 5.7 cows/stall/hour. Rotary parlors should have 6.5 cows/turns/hour, or more if they have 60 or more stalls.

6. Milk/stall/hour should be 115 lb (52.3 kg) or more for 3X dairies, and 150 lb (68.2 kg) or more for 2X dairies.

7. Peak milk flow is defined as the amount of milk produced between the first and the second minute. There are differences between equipment manufacturers, with GEA Farm Technologies Inc. metered systems having slightly higher peak milk yields on a consistent basis. Peak milk flow for a 3X dairy should be 8.5 lb (3.8 kg) or more, and for 2X dairies it should be 10.5 lb (4.7 kg) or more.

The following series of 3 parlor performance summaries are from a double 42 parlor operated with 3 milk-harvest technicians and 1 cow mover bringing cows to the parlor (Figures 1, 2, 3). This dairy prints an individual parlor report for 3 separate sections of the parlor, and the technicians follow a territorial routine within their own designated areas. Parlor performance and the consistency from milking to milking improved dramatically when separate monitoring for individuals was implemented several years ago. Note how consistent the previously discussed monitors are for all 3 shifts. This is an older GEA parlor that does not offer all of the parameters, in particular the 2-minute milk, on the Dairy Comp report. The difference in total milking time from the first shift to the other 2 shifts is due to only treating cows at milking number 1. The takeoff settings for this parlor are set at a total of 6 seconds for the 2 parameters on the C 12 GEA meter. The factory defaults for these 2 were 40 seconds. Changes are made slowly over time, which allowed the dairy to milk significantly more cows and have much more consistent overall parlor performance.

A key to becoming more involved in milk quality and parlor performance is to understand all of the data being generated by the parlor automation. Parlor

PEN	Total Milk	Milk /Hr	Milk /Cow	Cows	Cows /Hr	Total Time	Start Time	Stop Time	Avg #/m	Avg Dur	Avg Dev	Not ID
1	4130	7080	19	213	365	0:35	0:18	0:53	6.6	2.9	0	12
No ID	792	115	30	26	3	6:52	0:38	7:31	8.2	3.7	0	0
2	6365	12730	35	180	360	0:30	0:53	1:24	9.0	4.0	0	6
8	6262	11050	24	259	457	0:34	1:23	1:58	7.6	3.2	-2	4
9	7931	13218	31	260	433	0:36	1:56	2:32	8.5	3.6	-2	3
10	7715	6708	29	263	228	1:09	2:30	3:40	8.2	3.6	-3	-1
11	8740	13110	29	306	459	0:40	3:02	3:42	8.0	3.6	-3	5
12	7784	4916	30	257	162	1:35	3:19	4:54	8.1	3.8	-3	6
3	8660	7021	33	266	215	1:14	4:07	5:21	8.6	3.9	-2	-5
4	10124	15985	39	260	410	0:38	5:19	5:57	9.5	4.2	-4	2
5	10315	11677	40	260	294	0:53	5:44	6:37	9.4	4.3	-4	-1
6	7794	11134	30	256	365	0:42	6:35	7:17	8.0	3.9	-2	3
7	9200	14526	35	260	410	0:38	7:11	7:50	9.0	4.0	-3	4
Total	95812	12718	31	3066	406	7:32	0:18	7:50	8.4	3.8	-2	38

Description	Pen	1	0	2	8	9	10	11	12	3	4	5	6	7
% Units were attached	28	19	0	26	27	29	15	30	11	15	32	23	26	30
Milk / stall / hour	144	78	1	142	123	147	75	146	55	79	180	132	125	162
Cows / stall / hour	4.6	4.0	0.0	4.0	5.1	4.8	2.5	5.1	1.8	2.4	4.6	3.3	4.1	4.6

Error Summary:	Pen	1	2	8	9	10	11	12	4	5	6	7
Reattach	37	2	0	3	2	1	1	7	8	6	5	2
Entered Twice	1	0	0	0	0	0	0	0	0	1	0	0
Suspect Wt	2	0	0	0	0	0	0	0	0	1	1	0
Early Falloff	13	2	0	2	0	0	4	2	1	0	0	2
Late Rehang	7	3	1	0	0	0	0	0	1	1	1	0
Total	60	7	1	5	2	1	5	9	10	9	7	4

Figure 1. Milking report for 6/1/14 milking 1 at 08:17 AM.

PEN	Total Milk	Milk /Hr	Milk /Cow	Cows	Cows /Hr	Total Time	Start Time	Stop Time	Avg #/m	Avg Dur	Avg Dev	Not ID
1	4239	8478	20	212	424	0:30	8:35	9:06	6.5	3.0	-3	13
No ID	773	107	30	26	3	7:11	8:37	15:48	7.6	4.0	0	0
2	6610	13675	36	182	376	0:29	9:10	9:40	9.1	4.0	-1	4
8	6274	3245	24	260	134	1:56	9:39	11:35	6.9	3.5	-3	3
9	8647	13303	33	260	400	0:39	10:16	10:56	8.5	3.9	-1	3
10	8611	13596	33	263	415	0:38	10:54	11:32	8.5	3.9	-1	-1
11	9840	14400	32	304	444	0:41	11:29	12:11	8.4	3.9	-1	7
12	7710	9440	30	255	312	0:49	12:00	12:49	8.3	3.7	-1	8
3	7919	6014	29	270	205	1:19	12:11	13:30	8.4	3.6	-1	-9
4	9493	16273	37	259	444	0:35	13:32	14:08	9.7	3.9	-1	3
5	9895	14135	39	257	367	0:42	14:02	14:44	9.5	4.1	-1	2
6	7096	12522	28	255	450	0:34	14:43	15:18	8.2	3.5	-1	4
7	8002	14121	31	258	455	0:34	15:17	15:51	8.8	3.6	-2	6
Total	95109	13118	31	3061	422	7:15	8:35	15:51	8.4	3.7	-1	43

Description	Pen	1	0	2	8	9	10	11	12	3	4	5	6	7
% Units were attached		29	24	0	27	8	29	30	32	21	13	32	28	29	30
Milk / stall / hour		148	96	1	150	36	148	152	161	106	68	183	160	138	159
Cows / stall / hour		4.7	4.8	0.0	4.1	1.5	4.4	4.6	4.9	3.5	2.3	5.0	4.1	4.9	5.1

Error Summary:	Pen	1	0	2	8	9	10	11	12	3	4	5	6	7
Dry	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Reattach	63	9	1	1	20	7	7	2	6	1	1	3	4	1
Entered Twice	3	0	0	0	1	0	0	0	0	2	0	0	0	0
Suspect Wt	1	0	0	0	0	1	0	0	0	0	0	0	0	0
Early Falloff	24	1	0	1	5	4	0	6	1	1	2	1	1	1
Late Rehang	12	5	0	1	1	3	0	1	0	0	0	1	0	0
Total	104	15	1	3	27	16	7	9	7	4	3	5	5	2

Figure 2. Milking report for 6/1/14 Milking 2 at 04:01 PM.

summaries are routinely printed after every milking, and can be reprinted using the Dairy Comp command of "parlor\P". This will allow you to select the milking you would like to review, and also to reach the PG 305 section of Dairy Comp. Another Comp command is simply "parlor", which will lead to detailed data on a stall-by-stall basis for the entire milking. Once you select a milking, it will bring you into the deviation for each stall for review. Simply pressing the "escape" key will bring up a menu that will allow selection of various parameters. These include order of attachment, time of attachment, and milking duration. Selecting "milking duration" and then the "graph" key at the bottom will give a graphic presentation of all the pens in the barn. Using the mouse, you can expand the data to see the staggered unit attachments that are occurring, which allows evaluation of whether the procedures and protocol were being followed properly in the parlor.

When either the "parlor\P" command or the simple "parlor" command is entered, if you select "milking summary" you will then be able to graphically depict any of the data found on the parlor summary sheet. Only 2 data points should be plotted to allow easy assessment of parameters, such as average flow and average milking duration with a separate range on each side of the graph.

DHIA SCC Evaluation

If the dairy is utilizing Dairy Herd Improvement Association (DHIA) individual somatic cell count, information using the command guide on Dairy Comp will allow detailed analysis of this data. Key parameters to monitor are the new infection rate, the chronic level, and the cure rate. These parameters are based on a cow moving from below a linear score of 4 to above a linear score of 4 as new infections, moving from a score above 4 to below 4 for cure, and with 2 or more consecutive counts over a linear score 4 as chronic cows. The goal is to maintain the new infection rate at 7% or less, which will allow the herd somatic cell count to begin to drop, and to maintain the chronic level as low as possible. The new infection rate in this dairy is depicted as a yellow section at 9%, the chronics as a red section at 6%, and green are cures that occurred since the last test at 6%.

```
            Total  Milk   Milk           Cows   Total  Start   Stop   Avg   Avg   Avg   Not
      PEN   Milk   /Hr    /Cow   Cows    /Hr    Time   Time    Time   #/m   Dur   Dev   ID
      ----- ------ ----   ----   ----    ----   -----  -----   -----  ---   ---   ---   ---
        1   3996   6480    19    214     347    0:37   16:27   17:05  6.3   2.9    0    11
No ID     795    124    25     32       5    6:23   16:40   23:03  7.8   3.1    0     0
        2   6174  12773    34    184     380    0:29   17:05   17:35  9.1   3.8    0     2
        8   6133   3716    23    263     159    1:39   17:33   19:13  7.6   3.1   -2     0
        9   7363  13805    29    258     483    0:32   18:06   18:39  8.7   3.3   -4     5
       10   7308  13287    28    261     474    0:33   18:37   19:11  8.5   3.3   -3     1
       11   8204  12306    27    304     456    0:40   19:09   19:49  8.3   3.3   -5     7
       12   6863  12478    27    254     461    0:33   19:48   20:21  8.6   3.2   -4     9
        3   7426   9093    28    267     326    0:49   20:19   21:09  8.4   3.4   -5    -6
        4   9082  16512    35    256     465    0:33   21:03   21:37  9.7   3.7   -4     6
        5   9279  14651    36    259     408    0:38   21:30   22:08  9.6   3.8   -4     0
        6   6711  12201    27    253     460    0:33   22:06   22:40  8.1   3.4   -3     6
        7   7591  13801    29    258     469    0:33   22:38   23:12  8.8   3.4   -5     6
      ===== ====== ====   ====   ====    ====   =====  =====   =====  ===   ===   ===   ===
Total     86925  12877    28   3063     453    6:45   16:27   23:12  8.5   3.4   -3    47

Description                 Pen    1     0     2     8     9    10    11    12     3     4     5     6     7
-------------------------   ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----
% Units were attached         28    18     0    26     9    29    29    28    27    20    31    29    28    29
Milk / stall / hour          146    71     1   142    41   152   147   138   139   102   183   164   135   153
Cows / stall / hour          5.1   3.8   0.0   4.2   1.7   5.3   5.2   5.1   5.1   3.6   5.1   4.6   5.1   5.2
-------------------------   ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----

Error Summary:        Pen    1     2     8     9     3     4     6     7
-------------------   ----  ---   ---   ---   ---   ---   ---   ---   ---
Reattach                11     3     3     2     0     1     0     1     1
Early Falloff            8     3     0     0     1     2     0     2     0
Late Rehang              2     1     0     0     0     0     1     0     0
===================   ====  ===   ===   ===   ===   ===   ===   ===   ===
Total                   21     7     3     2     1     3     1     3     1
```

Figure 3. Milking report for 6/1/14 milking 3 at 12:08 AM.
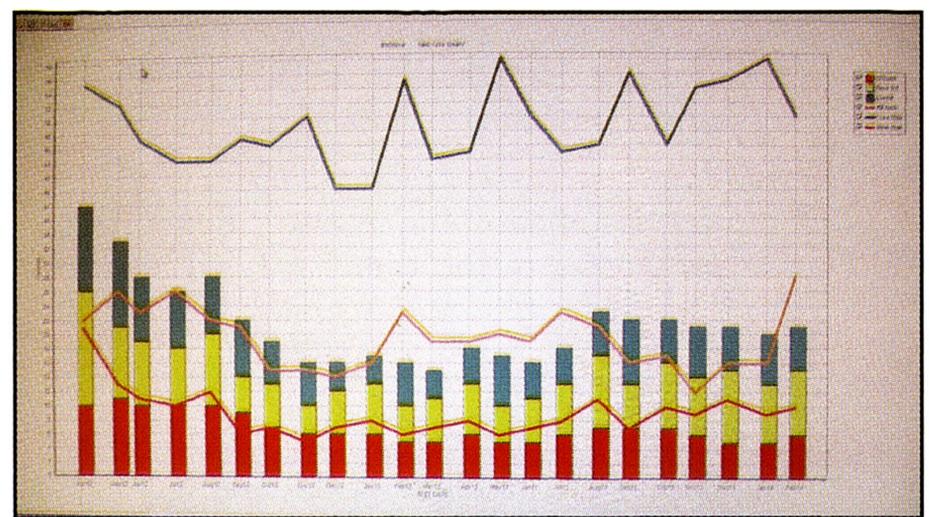
Clinical Mastitis Records

Dairies on Dairy Comp can easily be evaluated graphically for clinical mastitis (Figure 4). The command in Dairy Comp is "EGRAPH", and then select "mastitis" and either "days of event" or "days-in-milk". I have some dairies that print the "days of event" graph every week, which is posted for all milk-harvest technicians.

Conclusions

At the 45th annual AABP Conference in Montréal, Dr. Ken Nordlund commented "that the single most apparent characteristic of veterinarians who thrive in large herds is that they are viewed as the authoritative person with the herd health and production data." Milk quality monitoring is an area that many veterinarians are not involved in on a regular basis. The work can be challenging, but it is definitely rewarding for both the practitioner and the producer.

Reference

1. Treichler B, Reid D. Review of parlor summaries from 3X herds in the United States, *Proceedings*. Annu Conf Nat Mastitis Coun 2013.

Figure 4. Dairy Comp graphic depiction of clinical mastitis.