

Reviewing and Monitoring Herd Performance Using Dairy Comp 305

(12.20.2006)

Three points

- 1) Measure current performance. All profit begins with actions today and into the future. There is no way we can make money from previous errors. We certainly do not want to re-address a problem that was solved 8 months ago.
- 2) Error on the side of action vs inaction. Specificity vs Sensitivity - Most of the issues we will be looking for will have large financial implications, and the cost of a little further investigation will be small compared to the cost of the issue continuing until we are certain that our indicators are pointing to a problem.
- 3) Do not confuse monitoring a herd with describing a herd. While you can accurately say that a herd's average days in milk at first breeding is 120, you can not determine if you should intervene based on that information.

Good information reflects current performance. If the herd had a problem several months ago, but the problem was fixed last month, our "good" information will not suggest we intervene today.

- 1) Good information reflects a problem very soon, preferably the first day, that the problem begins.
- 2) Good information reflects improved performance very soon, preferably the first day that the problem is solved.
- 3) Good information tracks herd performance that is directly tied to herd profitability.

Example:

Rather than measure when we got animals first bred (average days in milk at first breeding) a year ago, or miss a group of animals that have not had their first breeding, but should have, let's look for animals that should get bred now. We prefer counting and listing animals that are more than 70 days in milk and not yet bred.

The following are reports from Dairy Comp that are not meant to be the final word in how to monitor and evaluate a dairy herd, but they do represent a good place to start and demonstrate many Dairy Comp 305 functions.

Reviewing and Monitoring Herd Performance Using Dairy Comp 305

Production

MKDEV is the difference between what the animal “gave” and what we expected her to give. A positive number, means she was “up” and a negative number means she was “down”. (We expect the animal to give the amount of milk this month that will result in the same ME305 as she had last month.)

SUM DIM PMILK MILK MKDEV BY PEN FOR PMILK>0 DDAT=0\Z

The “Z” forces inclusion of zeros in the average.

- Command : SUM DIM PMILK MILK MKDEV BY PEN FOR EMILK>0 DDAT=0\Z								
By	PEN	%COW	#COW	Av	DIM	AvPMILK	Av MILK	AvMKDEV
	1	25	46		178	83	76	0.9
	2	44	79		262	74	64	-1.5
	4	28	51		195	94	88	6.1
	6	0	1		144	77	48	-24.0
=====								
Total		100	177		220	82	74	1.1

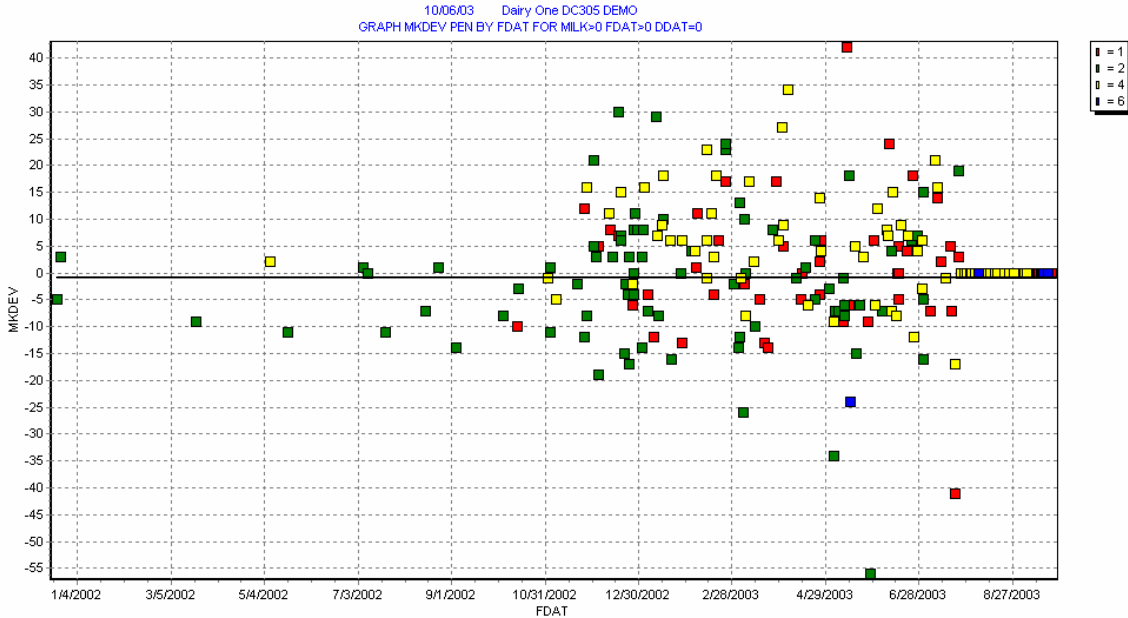
Even though the average milk is less than last month’s milk for these cows, MKDEV says the cows are up, by about a pound (negligible).

We use the Z switch because a zero is relevant for MKDEV. A zero MKDEV means the animal did not deviate from what we expected her to give. Without the Z switch Dairy Comp ignores zeros when averaging.

We included animals that have an EMILK (expected milk) and are not dry, (DDAT=0). Fresh animals do not have an EMILK. MKDEV is most helpful the second and later tests.

A scatter plot of MKDEV by Fresh Date gives much more information. Each dot is a cow, plotted against MKDEV and Days in Milk.

GRAPH MKDEV BY FDAT PEN FOR MILK>0 FDAT>0 DDAT=0



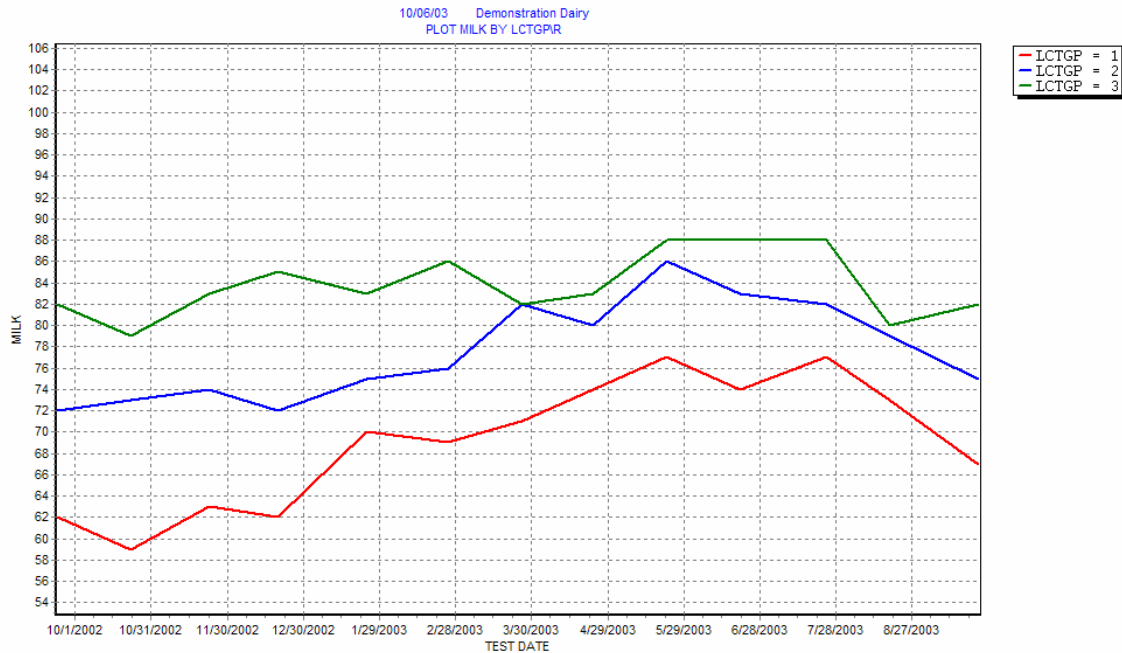
Our goal is that “MKDEV” (milk deviation) is zero or higher. This chart gives the overall impression that there are more cows above zero than below, but clearly, later lactation, pen 6 animals, are “down” this test day.

Scatter plots remove some of the illusion of tidy summaries that simple averages can imply. They show not only all of the data, but also its distribution and variation.

We can not make money by intervening on history, because we can not do anything about history but at times a historical context can give us an impression of how the herd production has been changing.

Test Day Average Milk by Test Day and Lactation Group

PLOT MILK BY LCTGPR (R reverses to avoid using lactation curves.)



Generally all lactation groups have trended up in production with a recent down turn. To have greater confidence in the production changes we must try to account for changes in age and days in milk shifts.

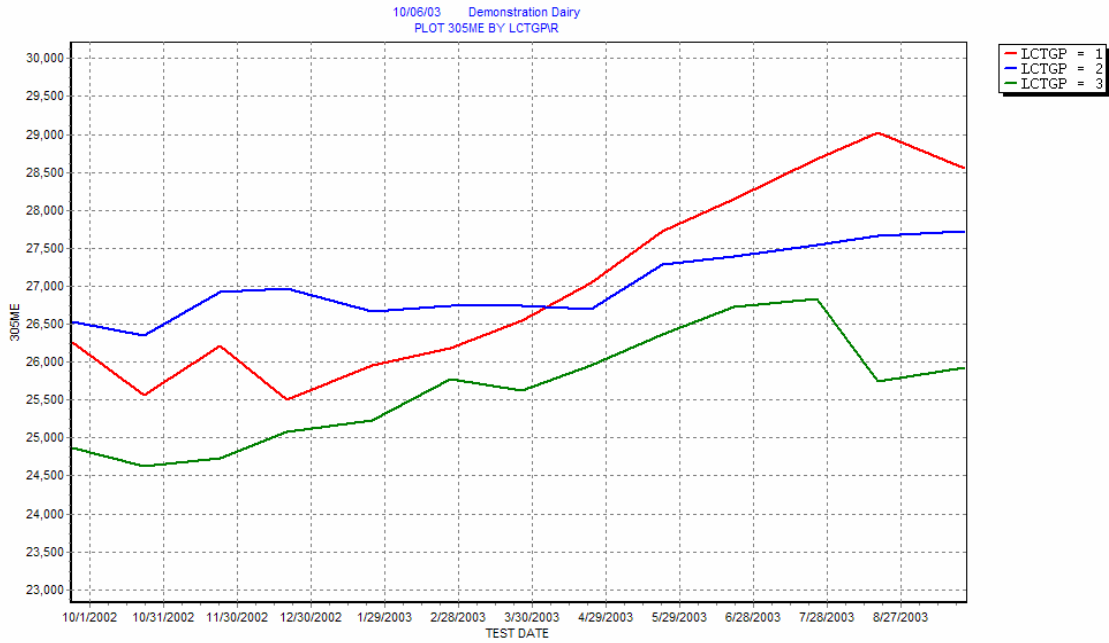
PLOT is a command in Dairy Comp that allows graphing the testday, information that is listed on the “Test Days” tab of a cowcard. The default for the PLOT command is to line up the test day information by each animal’s test day, resulting in “lactation curves”. The \R reverses this position and lines the data up by test dates rather than by test day number.

While Dairy Comp 305 can make traditional lactation curves using the PLOT command, animals have their First, Second, Etc. test day at different times of they year, on different rations, with different management. Aggregation of different conditions makes drawing conclusions about current performance unlikely.

A good way to attempt to account for monthly production changes considering lactation numbers and days in milk is to look at the average “Mature Equivalent adjusted record” also known as the 305 day ME. The “ME” is adjusted for Days in Milk, age, and season of calving.

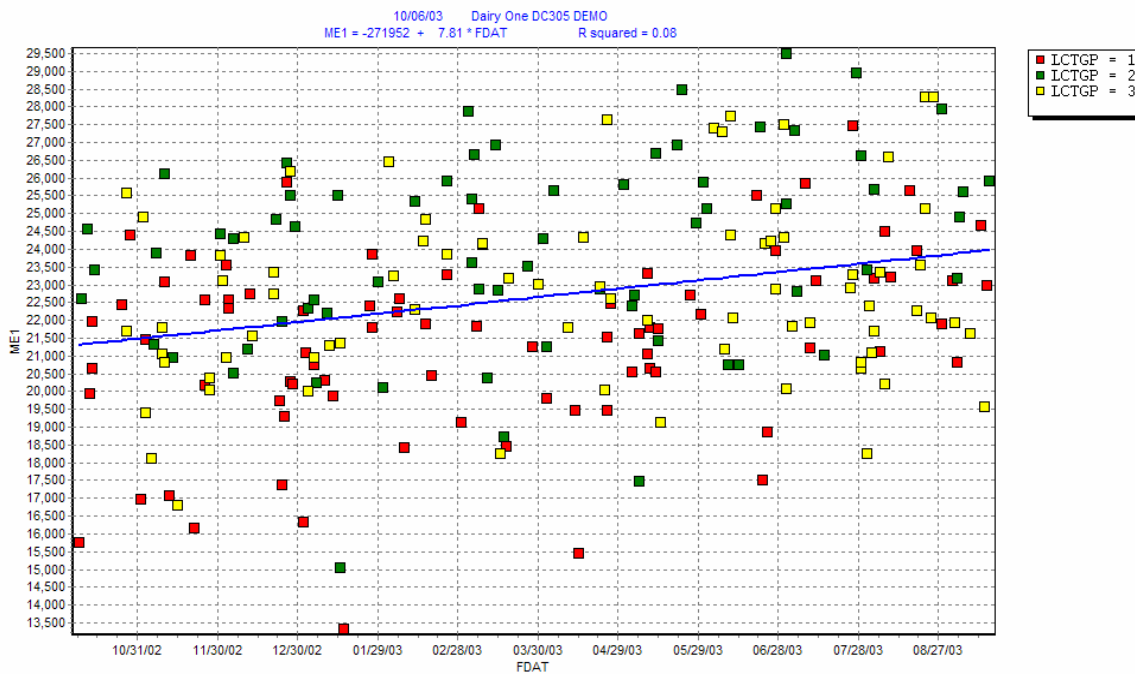
305 ME by Test Day and Lactation Group

PLOT 305ME BY LCTGPR



First Testday ME Projection by Fresh Date

GRAPH ME1 BY FDAT LCTGP FOR FDAT>-365\BR (B includes both dead and alive animals, the R invokes the regression line). Animals on the right calved most recently.



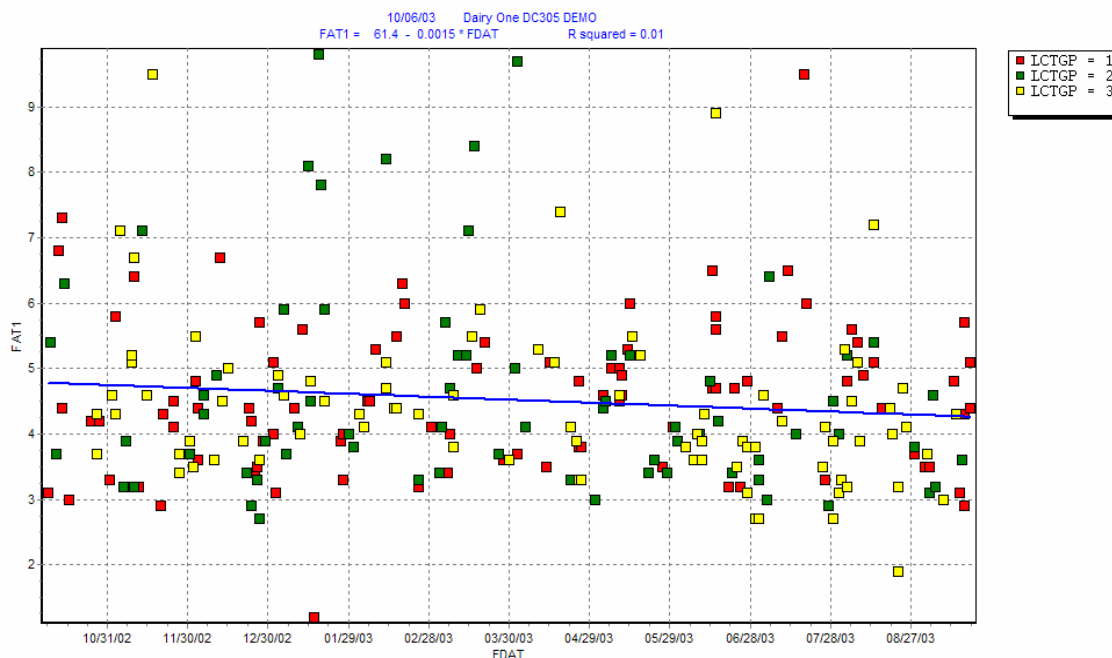
How are cows starting their lactations? ME1 is the first test day ME. We see the cluster of animals more recently fresh are “higher” and less varied than animals that calved earlier in the year. The “for” statement of FOR FDAT>-365 means the Fresh Date is in the last 365 days. If you must create the Item ME1 is an Item type 86, Test Day 305 Milk, first value is 1, to point to the first test, and the second value is 0, to not “ME” the number as it is written into the cowfile ME adjusted. (You also might find the item under the name FSTPJ

How healthy are animals calving? Increasingly dairies are tracking their incidence of disease and implementing diagnostic protocols. One indication that works independently of how the dairy records their disease information is the test day fat percentage.

Looking at the first test day fat by month of calving can help us begin to understand how the cows are making the transition from their dry period back into high production.

First Test Day Fat Percentage by Fresh Date.

GRAPH FAT1 BY FDAT LCTGP FOR FDAT>-365\B (B includes both dead and alive animals, the R invokes the regression line).



The “FAT1” graph serves as another screening tool to find potential metabolic imbalances in fresh cows, and adds a bit of historical perspective.

This herds “Fat1” shows that recently fresh animals have reasonably typical fat percentages although previous months there were scatterings of higher first test day fats. That suggests that animals calving recently, are likely in a good metabolic state. The

label is by lactation group to help us highlight any differences there may be between lactation groups.

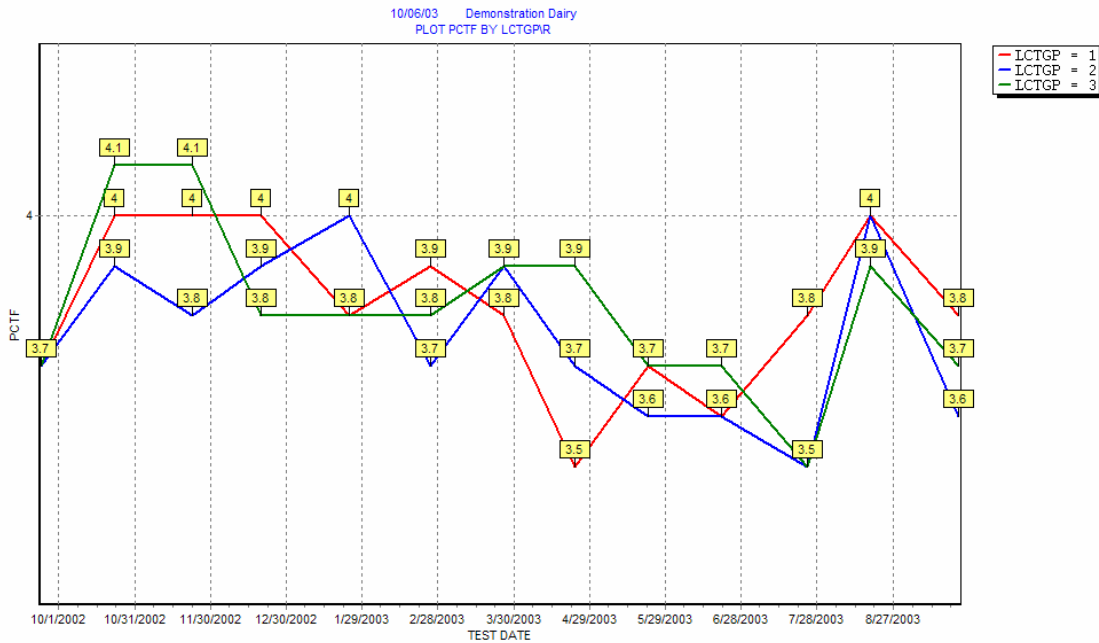
Higher than "normal" butterfat in individual Fresh cows can be a sign of metabolic difficulties. These cows usually are in a state of extremely rapid weight loss. These cows often have a history of metabolic problems such as ketosis, fatty liver, and/or displaced abomasums. Clearly defined thresholds for suspect Fats are not set, but clusters of fresh animals with a fat1 percentage higher than 5.5 may merit further investigation. Fat1 is a

Type 83 Item with the first value 1 for first test, and the second value 0 for % fat.

Low fat tests can mean acidosis, or show animals that had other metabolic problems but have run out of body condition.

We can look at the herd average percentage fat by lactation group and determine that this herd has not had any overall abnormal swings in fat test.

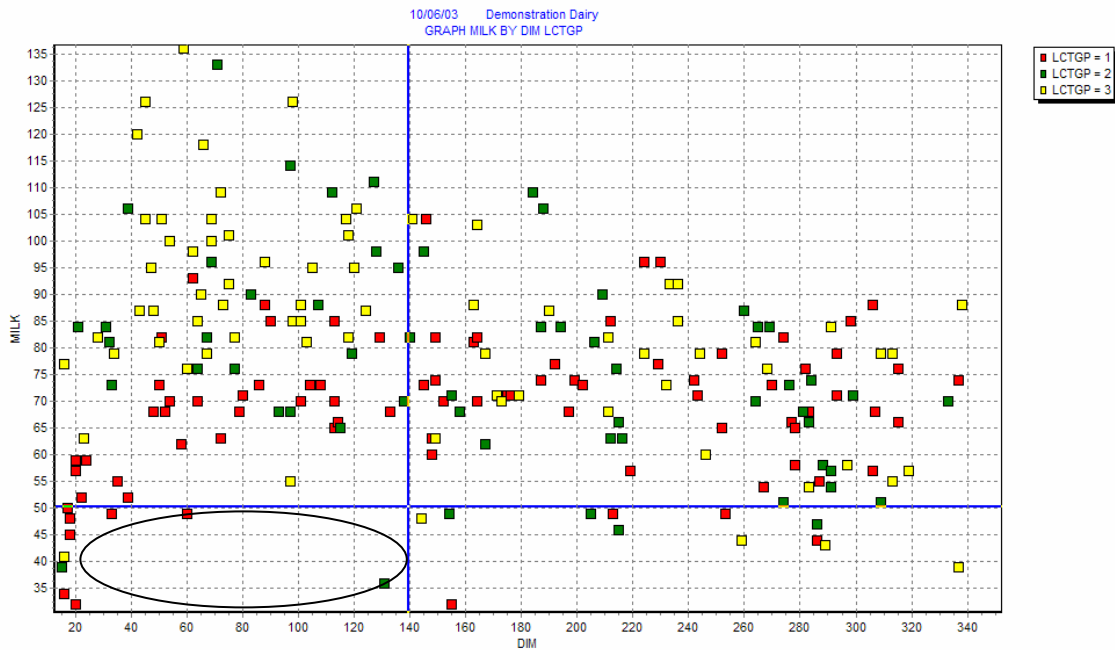
PLOT PCTF BY LCTGP



“left clicking” on the line will force it to display the values it is graphing.

Looking for “Broken” Cows

GRAPH MILK BY DIM LCTGP



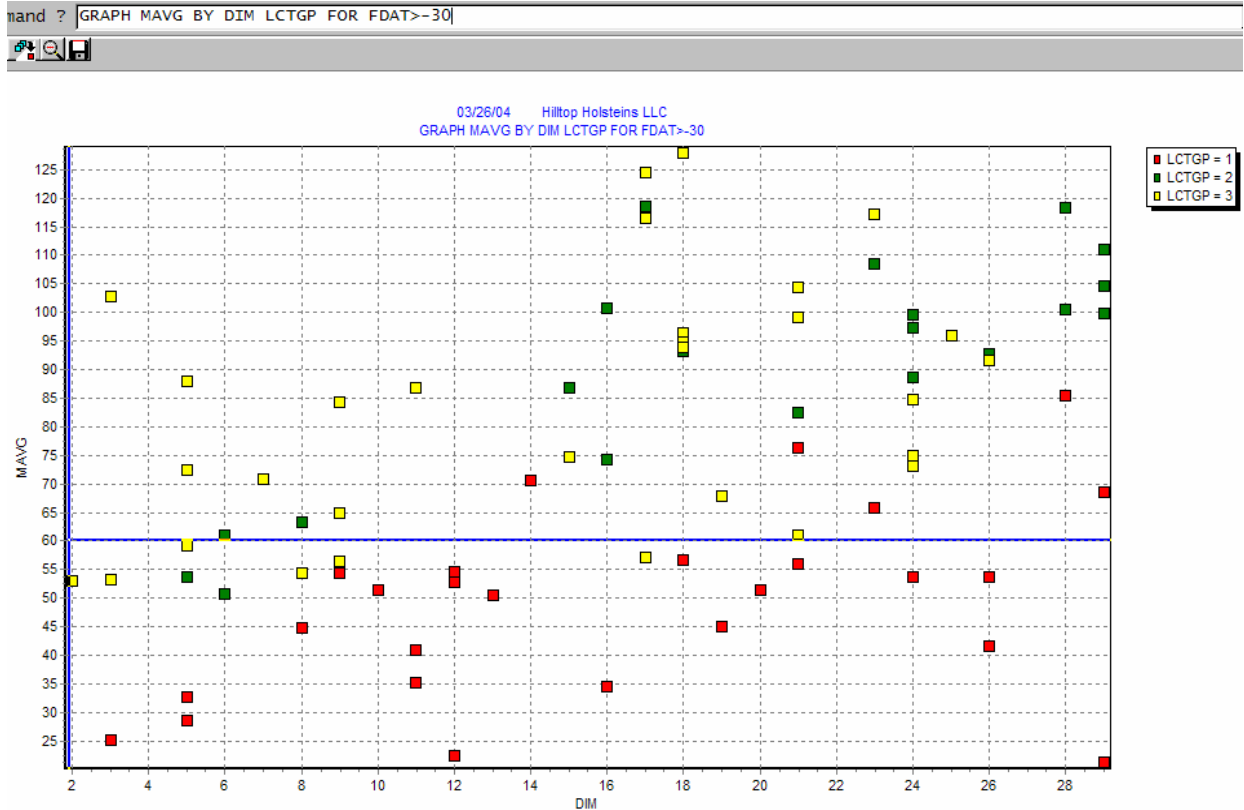
A simple monitor is to look at the number of animals producing less than 50 pounds in the first 150 days in milk. Modern dairies will not have many animals in this 50x150 AKA “Looser” box. Higher producing herds could use a 60 pound or even higher threshold for failure the first 150 days. Other than very fresh animals, this herd only has a couple of animals showing up in the box.

The first month something breaks on the dairy, a cluster of animals may appear in this box past.

Using **Daily Milk Weights** for watching Fresh Cows

Collecting milk weights from cows daily gives the opportunity to look a little closer at how cows are milking

GRAPH MAVG BY DIM LCTGP FOR FDAT>-30



In this dairy MAVG is defined as the average of the last 7 days milk weights. Clusters of “low” cows and high cows can give us hints about how the fresh cows are doing relative to production levels.

This is a summary of animals less than 30 days fresh.

Command ? SUM MAVG MTOT MDEV BY LCTGP FOR FDAT>-30 MTOT>0\Z

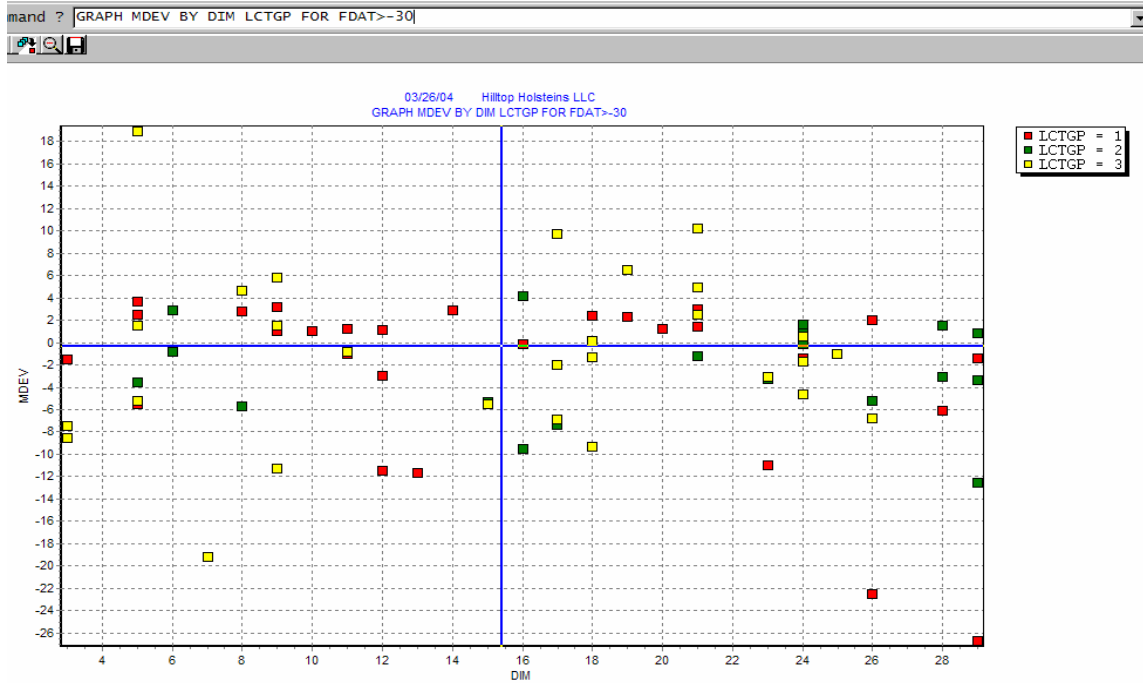
By LCTGP	%COW	#COW	Av MAVG	Av MTOT	Av MDEV
1	36	28	49.6	48.9	-2.5
2	25	20	90.3	91.3	-2.4
3	37	29	83.1	85.5	-0.9
====	====	====	====	====	====
Total	100	77	72.8	73.7	-1.8

MTOT is the daily total production, and MDEV is the difference between what we expected the animals to give today, and what they actually gave today. If fresh cows do not increase production they have a negative MDEV. Since zero is relevant in MDEV

(the animal gave exactly what we thought she should have) we add the Z switch to force zeros in the averages.

Looking at MDEV BY DIM for fresh cows with daily milk weights

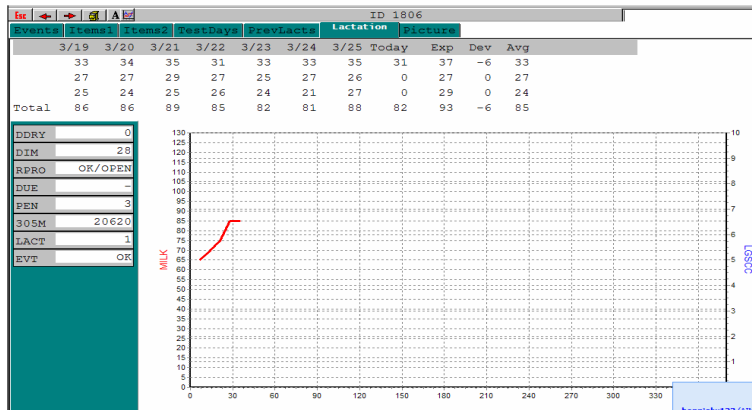
GRAPH MDEV BY DIM LCTGP FOR FDAT>-30



A zero MDEV means the animal gave just what we expected for her to be increasing appropriately, a minus means she is not. The animals from 20 to 30 days in this graph are “down”.

Some people like to page through Lactation Pages of the cowcards of recently fresh animals that are down in production from expected.

EXAM\6 FOR FDAT>-30 MDEV<-5



Pressing the “+” key will move you to the next animal that meets the criteria.

Lists may be the most efficient.

SHOW ID PEN DIM MAVG MTOT MDEV FOR FDAT>-30 MDEV<-6 BY MDEV

ID	PEN	DIM	MAVG	MTOT	MDEV
1883	3	29	21	14	-26
1840	3	26	41	34	-22
7539	4	7	70	66	-19
1408	4	29	110	114	-12
1892	3	13	50	38	-11
1964	3	12	54	43	-11
7799	4	9	56	62	-11
1932	3	23	65	54	-11
7222	4	16	74	68	-9
968	4	18	96	87	-9
941	4	3	53	44	-8
956	4	3	102	95	-7
1118	4	17	118	118	-7
7927	4	17	116	115	-6
9184	4	26	91	89	-6
1806	3	28	85	82	-6
Total:	16				

You can make a list of suspect animals with sensitivity that varies by days in milk. An example list :

SHOW ID PEN DIM MAVG MTOT MDEV FOR (MDEV<-6 DIM=1-30)(MDEV<-9 DIM=31-200)(MDEV<-15 DIM>200)

This above command will create a list of animals (based on daily milk weight deviations that are:

1-30 days in milk and down more than 6 pounds from expected or
 31-200 days in milk and down more than 9 pounds from expected or
 more than 200 days and down more than 15 pounds from expected

A list can help us look at all recently fresh animals.

SHOW ID DIM MILK EASE EVT REM EDAY LACT BY DIM DOWNBY FDAT FOR FDAT>-30\B

Command ? SHOW ID DIM MILK EASE EVT REM EDAY LACT BY DIM DOWNBY FDAT FOR FDAT>-30\B

SHOW ... BY DIM DOWNBY FDAT FOR FDAT>-30\B

ID	DIM	MILK	EASE	EVT	REM	EDAY	LACT
3329	2	0	1	FRESH	-	10/ 4/03	1
3335	3	0	1	FRESH	-	10/ 3/03	1
3066	4	0	2	FRESH	-	10/ 2/03	4
2876	5	50	2	DIED	HEMORRAG	9/24/03	4
3059	7	0	1	FRESH	-	9/29/03	4
3206	9	0	1	FRESH	-	9/27/03	2
3102	12	0	1	FRESH	-	9/24/03	3
3324	13	0	3	DA	PENG	9/27/03	1
3205	15	39	1	RP	-	9/22/03	2
2736	16	41	1	TREAT	ECPPENG	9/27/03	4
2858	16	77	1	FRESH	-	9/20/03	4
3320	16	34	1	FRESH	-	9/20/03	1
3326	17	50	1	FRESH	-	9/19/03	1
3314	18	48	3	FRESH	-	9/18/03	1
3325	18	45	3	FRESH	-	9/18/03	1
3279	20	32	3	FRESH	BACKWARD	9/16/03	1
3306	20	57	1	FRESH	-	9/16/03	1
3317	20	59	3	FRESH	-	9/16/03	1
3166	21	84	1	FRESH	-	9/15/03	2
3323	22	52	1	FRESH	-	9/14/03	1
2840	23	63	1	RP	ECPPENG	9/15/03	4
3319	24	59	2	FRESH	-	9/12/03	1
2733	28	82	2	RP	ECP	9/12/03	5
Total:	23						

The \B switch is important to be sure we are looking the fresh animals that we had to sell.

Herd Reproduction is another important aspect of a herd's productivity that must be understood and monitored to continue to grow herd profitability. There have been many ways the value of reproduction has been quantified. One more recent is that a pregnancy increases the value of an average animal by about \$300 dollars. Pregnancies in better animals are worth much more. Pregnancies in poorer animals might make the animal a greater liability.

Overall – current and historical herd reproductive performance is best summarized by the 21 day Pregnancy Rate.

BREDSUM\E

- Command : BREDSUM\E												
Date	Ht Elig	Heat	Pct	Pg Elig	Preg	Pct	Aborts	25	50	75	100	
=====	=====	=====	=====	=====	=====	=====	=====	%%	%%	%%	%%	
9/23/02	74	36	49	74	10	14	1	P	H			
10/14/02	64	34	53	64	12	19	0	P	H			
11/04/02	58	40	69	55	15	27	3	P		H		
11/25/02	54	23	43	53	10	19	3	P	H			
12/16/02	50	29	58	49	10	20	2	P		H		
1/06/03	44	15	34	44	8	18	0	P	H			
1/27/03	47	28	60	46	6	13	0	P		H		
2/17/03	63	37	59	62	8	13	2	P		H		
3/10/03	68	37	54	67	13	19	0	P		H		
3/31/03	62	33	53	61	9	15	0	P		H		
4/21/03	60	38	63	58	9	16	3	P		H		
5/12/03	59	32	54	59	7	12	1	P		H		
6/02/03	58	27	47	58	11	19	1	P	H			
6/23/03	65	32	49	65	12	18	3	P		H		
7/14/03	57	18	32	57	7	12	0	P	H			
8/04/03	69	40	58	68	6	9	2	P		H		
8/25/03	69	30	43	0	0	0	0	Undet	Preg	Stat		
9/15/03	65	44	68	0	0	0	0	Undet	Preg	Stat		
Total	952	499	52	940	153	16	21	P	H			

This breaks the herd down into 21 day periods and for each period lists the number of animals that are eligible to be bred, the number bred, the percentage bred, the number that were eligible to diagnosed pregnant or open, the percent pregnant and finally the number of the pregnancies that aborted.

Eligible animals are past their voluntary wait, not already pregnant, and not yet coded Not to Breed.

New to this analysis is listing the pregnancies that are lost or abortions.

Overall this herd has a 16 percent pregnancy rate. A more valuable number may be the more current pregnancy rate for the last 150 days.

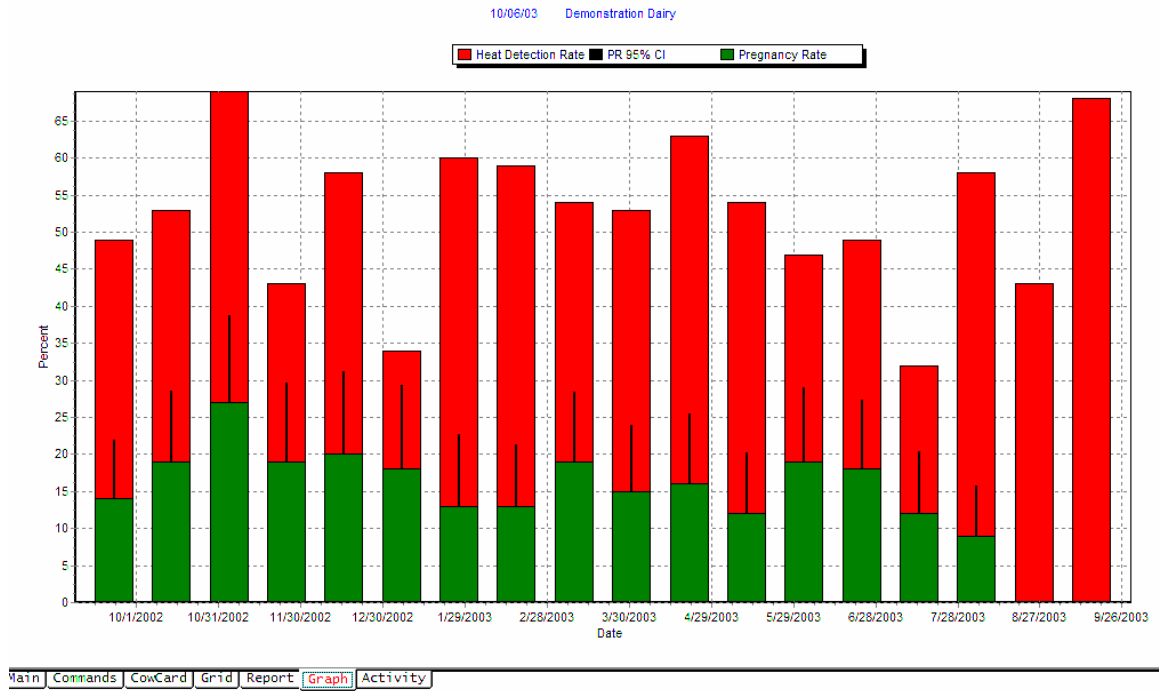
BREDSUM\ED150 (E runs the 21 day heat trial, and the D150 restricts the results to the last 150 days.

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- Command : BREDSUM\ED150
-----
Date      Ht Elig  Heat   Pct  Pg Elig  Preg  Pct Aborts  25  50  75  100
-----  -
5/11/03   54     32    59    54     7     13     1 P      H
6/01/03   58     27    47    58    10    17     1 P      H
6/22/03   64     32    50    64    13    20     3 P      H
7/13/03   56     13    23    56     5     9      0 P H
8/03/03   70     42    60    69     7    10     1 P      H
8/24/03   69     32    46     0     0     0     0 Undet Preg Stat
9/14/03   65     45    69     0     0     0     0 Undet Preg Stat
-----
Total     302    146   48    301    42    14     6 P      H

```

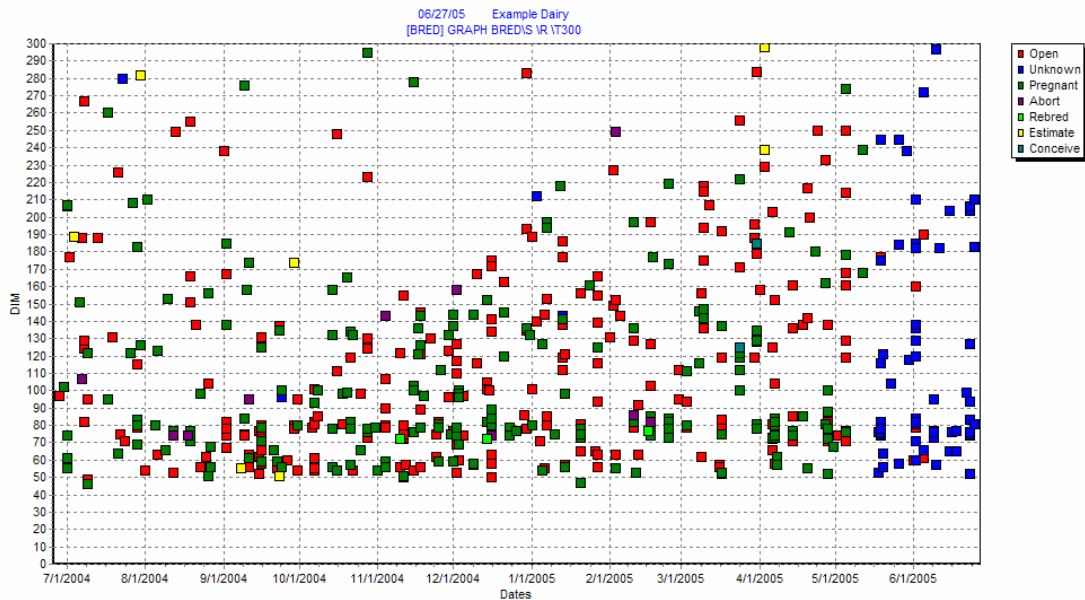
The pregnancy rate the last 150 days is 14 percent. Some people prefer to look at the pregnancy rate graphically.



This graph includes confidence “bars” that represent a 95% confidence range. The more animals in each group, the greater the confidence we can have that we can separate normal variation from changes in performance. If bars overlap, we are less than 95% confident that the values represent different performance.

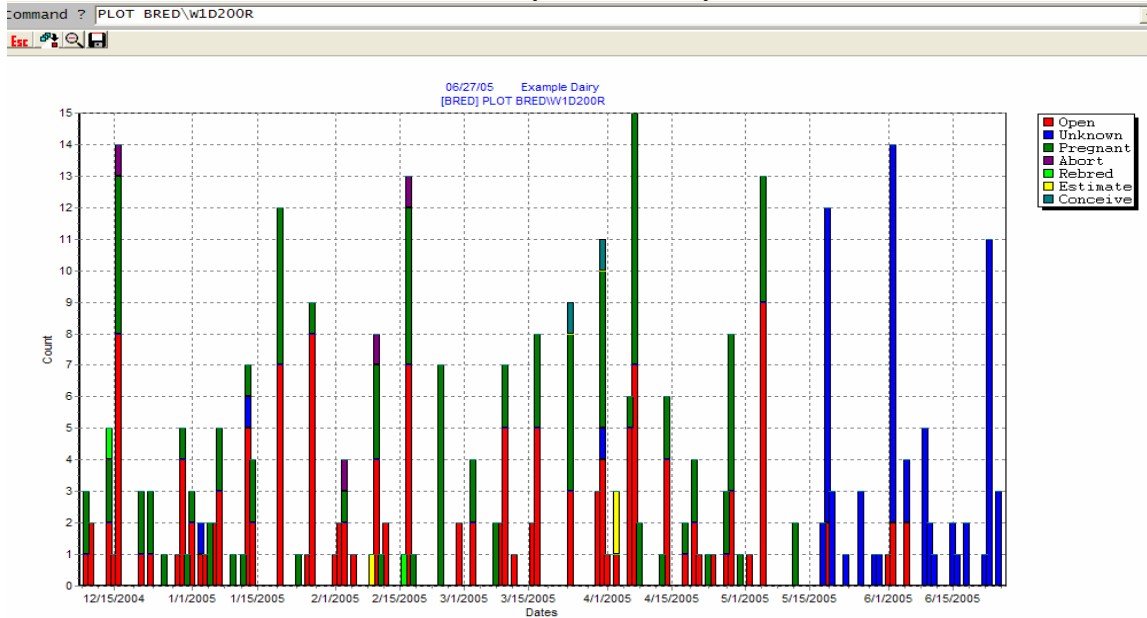
PLOT BRED\S \R \T300

An important component of the breeding program is the control the dairy exerts over the first service. Graphing the Bred events lets us not only see the current breeding patterns, but the results of those services.



This graph shows the first breeding pattern for the herd. All services are included. It is easy to see the first service policy and the color coding shows the results of each service.

PLOT BRED\W1D200R (Width of 1 day, last 200 days, with Result as label)



This graph shows a histogram of services by day in the last 200 days and allows us to get a sense of how much timed breeding vs visual heat detections is occurring and the results of breeding off visual heats vs. timed breedings.

A great monitoring point for heat detection is a list of animals more than 70 days in milk, and not bred yet, and not “do not breed”.

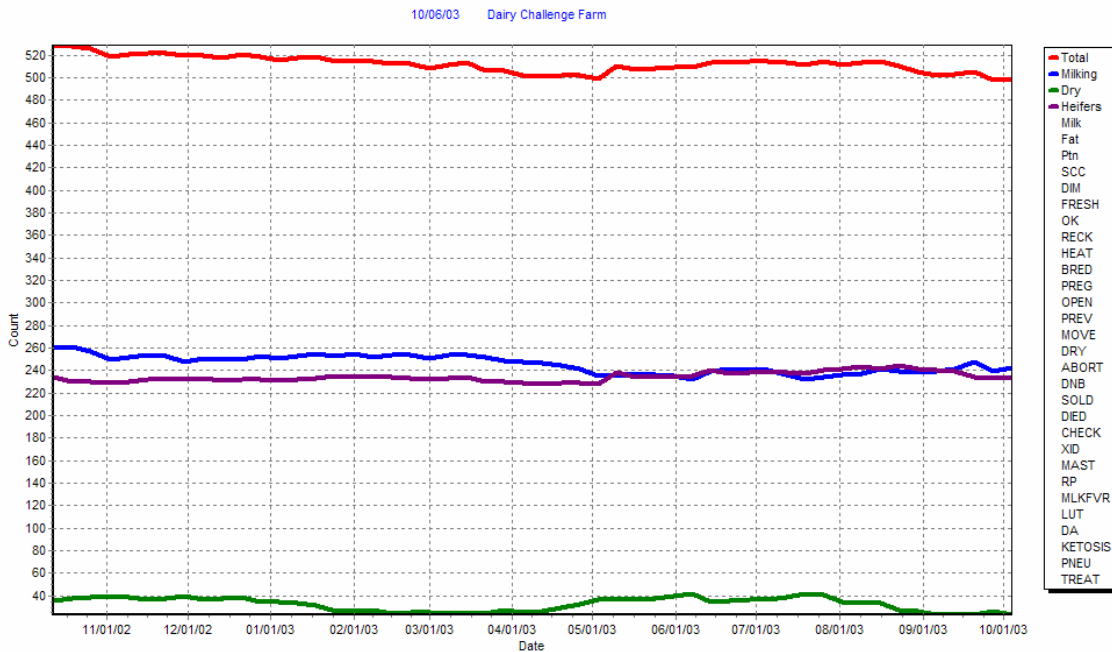
```
- Command : SHOW ID DIM LACT FOR DIM>70 TBRD=0 RC>1
```

ID	DIM	LACT
3086	73	3
3187	93	2
3189	97	2
3298	72	1

Total: 4

The broad dispersion of the graph tells us that the dairy is not following a tight synching protocol for fresh cows, and the short list of animals more than 70 days not bred tells us they do not currently have a problem getting the first service into their animals.

Herd Snap Shot – ECON\ID

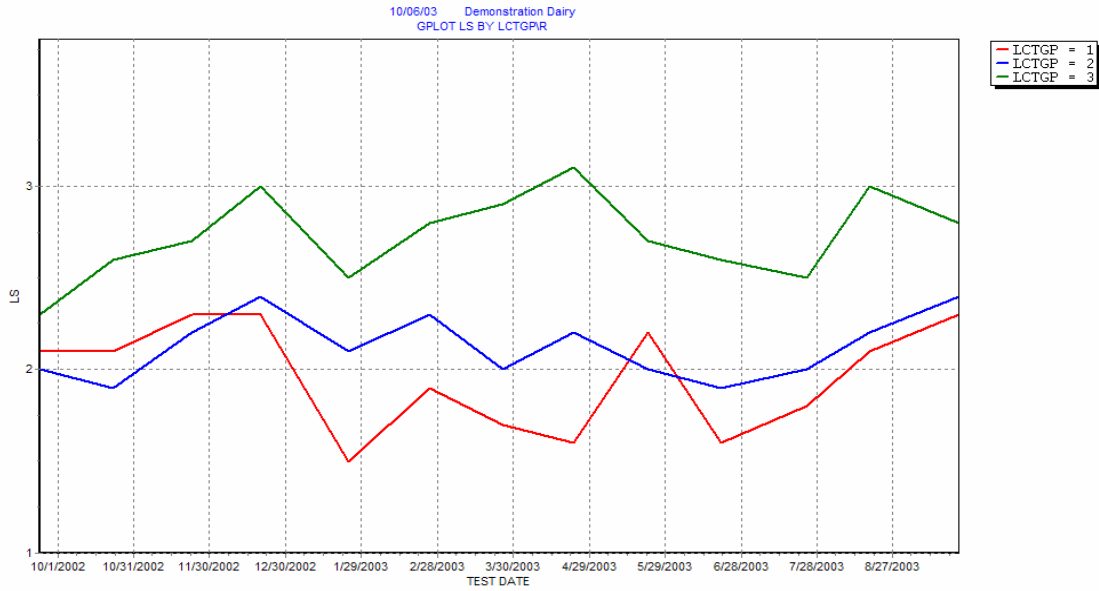


Cow numbers, both total and milking, are down, heifer numbers are steady or up slightly

From this graph we can “left click” to select various bits of information to display across the page. Turning on, and then off the various events and values, will help us examine each to determine if there are any current changes in performance in which we may benefit from intervention.

Udder Health

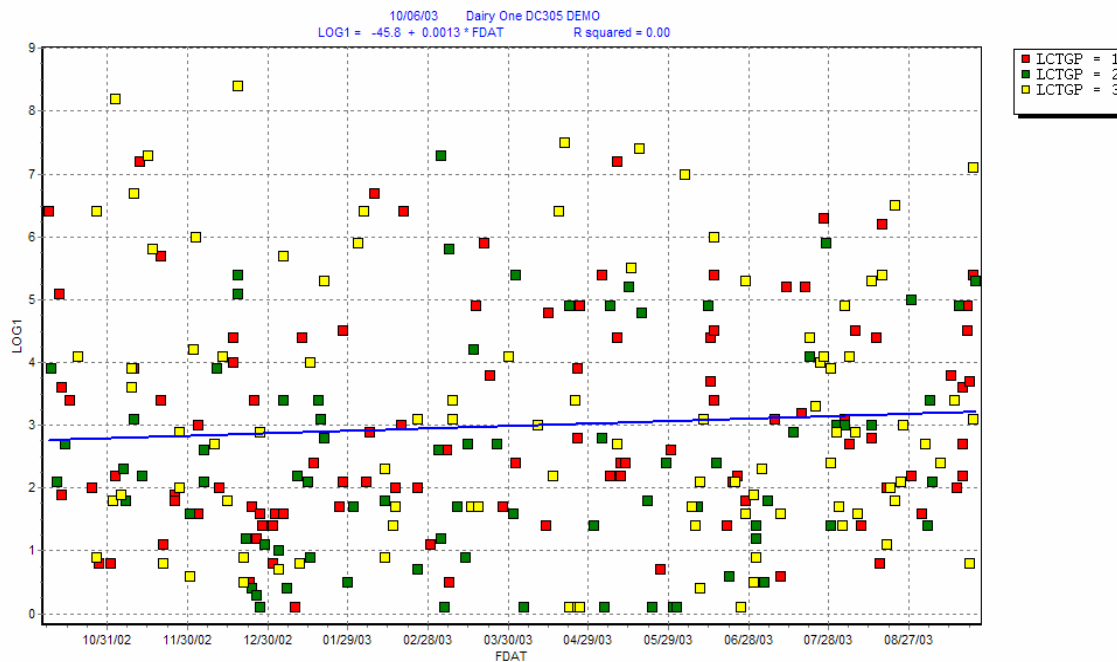
PLOT LS BY LCTGP\R



Above we can see that over time, the herd's Linear score does not show significant change from a year ago.

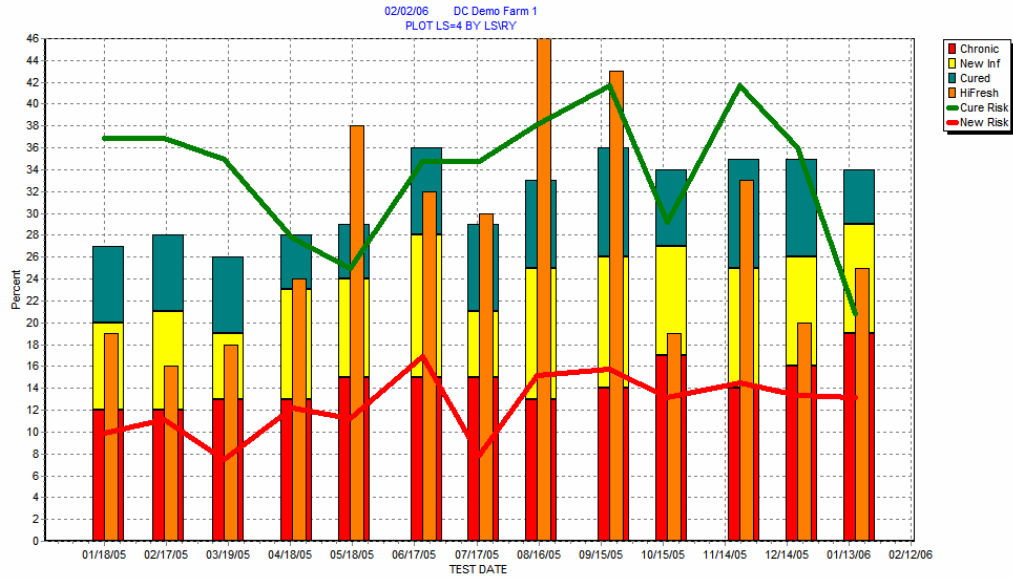
First Test Day Linear Score

GRAPH LOG1 BY FDAT LCTGP FOR FDAT>-365\BR (LOG1 might be LS1)



Here you can see the pattern of first test day SCC Linear Scores.

Herd Infection Dynamics
 PLOT LS=4 BY LS\RY



PLOT LS=4 BY LS\RY - the Graph Tab

On the graph, the green line is the risk infected animals will be cured, and the Red line is the risk that uninfected animals will become infected.

The report tab

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- Command : PLOT LS=4 BY LS\RY
LS          T E S T   D A T E S
           118  216  317  419  517  621  718  815  919  1017  1121  1219  116
Chronic %  12  12  13  13  15  15  15  13  14  17  14  16  19
           #  52  63  66  67  78  78  80  71  76  87  65  73  91
New Inf %  8   9   6  10  9  13  6  12  12  10  11  10  10
           #  36  46  33  49  45  65  34  63  64  51  54  47  49
Cured %    7   7   7   5   5   8   8   8  10  7  10  9   5
           #  32  34  36  24  26  42  42  44  55  37  45  44  22
Clean %    73  72  74  72  71  64  70  67  64  66  65  65  66
           #  329 371 380 365 369 328 370 365 342 335 306 306 318
HiFresh %  19  16  18  24  38  32  30  46  43  19  33  20  25
           #  21  9  11  15  23  24  16  25  15  6  16  10  17
LoFresh %  81  84  82  76  62  68  70  54  57  81  67  80  75
           #  91  49  51  48  37  52  37  29  20  25  33  40  51

Average   2.2  2.3  2.2  2.5  2.7  3.0  2.7  2.9  2.9  2.8  2.9  2.7  3.0
           #  561 572 577 568 578 589 579 597 572 541 519 520 548
  
```

PLOT LS=4 BY LS\RY - the Report Tab

This Plot command summarizes the whole year, by test date in terms of infection status. We set “infection” as 4 or higher in the command. Then it summarizes percentage and number of Chronic, New, Cured and Clean. Fresh cows are looked at separately as calving Lo (uninfected) and Hi (infected). The example herd is currently at an average linear score of 3.0 with 17, or 25% of the fresh cows infected. Note that you can also add FOR LACT=1 to evaluate the heifers only.

What happens in the dry period relative to infections?

- Command : SUM DRYLS=4 LS1=4 FOR DRYLS>0 LS1>0\B FDAT>-365
 -
 (DRYLS also might be named DRYLOG and LS1 might be labeled LOG1)

- DCFARM1 ----- Dairy One ----- 2/ 2/06---

	LS1 <4.0	LS1 ≥4.0	
DRYLS ≥4.0	56 17%	43 13%	99 30%
DRYLS <4.0	171 53%	51 16%	222 69%
	227 70%	94 29%	321 100%

This command divides the herd into animals that dried off “infected” – their last LS before dry off >3.9 and animals that dried of “uninfected” (<4.0). Then it compares how each group calved.

The horizontal line divides by dry off score, and the vertical line divides by first test day Linear Score.

56 animals, or 17% of the cows dried off with a linear score greater than 4 and a LS1<4 – they were “cured”. 43 animals or 13% dried off “high” and calved “low”.

The bottom left quadrant show that 171 or 53% dried off low and calved low. The bottom right shows 51 animals or 16% dried off low and calved high.

After looking at the last year’s calvings you might want to specify more recently fresh animals by changing the FOR statement to FOR DRYLS>0 LS1>0\B FDAT>-60 to just look at the last 60 days calvings.

Note: if DRYLS is empty in the cowfile you are working with you use the command EVENTS\7S DRYLS to populate it. Call support for help setting a farm cowfile up to collect it as animals dry off.

Disease

Disease incidence can tell a lot. This dairy is only beginning to record diseases. It appears they recently began recording Mastitis.

- Command : EVENTS -													
# Event	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 FRESH	303	27	16	26	19	24	27	27	29	26	23	24	35
2 OK	246	14	18	25	23	26	23	7	25	17	23	27	18
3 RECK	8	1	0	2	1	0	0	0	0	0	2	1	1
4 HEAT	100	12	14	11	4	8	2	1	3	7	13	16	9
5 BRED	971	80	82	91	99	84	72	72	96	89	69	76	61
6 PREG	306	34	22	28	28	24	26	31	21	1	23	34	34
7 OPEN	519	42	55	56	58	56	43	37	67	14	31	36	24
8 PREV	3	1	0	0	0	0	0	0	0	0	1	0	1
9 MOVE	1775	204	144	119	132	142	130	154	192	163	104	125	166
11 DRY	182	9	8	17	23	15	14	21	11	12	16	16	20
12 ABORT	36	5	3	1	2	3	3	3	4	3	5	3	1
13 DNB	109	7	8	4	4	9	1	9	3	11	37	5	11
14 SOLD	137	11	13	10	10	8	2	13	14	13	18	8	17
15 DIED	18	1	2	3	0	1	4	0	2	1	0	1	3
16 CHECK	112	8	13	12	10	10	13	12	11	10	1	9	3
18 XID	1	1	0	0	0	0	0	0	0	0	0	0	0
20 MAST	40	0	0	0	0	10	7	10	6	7	0	0	0
21 RP	34	1	3	1	3	1	6	3	6	6	1	2	1
22 MLKFVR	1	0	0	0	0	0	0	0	1	0	0	0	0
25 LUT	726	51	74	53	41	43	71	56	64	66	83	52	72
30 DA	18	2	1	0	2	2	1	2	2	3	2	0	1
31 KETOSIS	1	0	0	0	0	0	0	0	1	0	0	0	0
35 PNEU	1	0	0	0	0	0	0	0	1	0	0	0	0
37 TREAT	3	2	0	0	0	0	0	0	0	1	0	0	0

DA's appear to be holding steady, RP's might be showing a higher incidence than earlier this year. It also appears they recently began recording Clinical Mastitis (MAST).

EVENTS\5S7W

Command ? EVENTS\5S7W								
EVENTS\5S7W								
Event	Total	Mon	Tue	Wed	Thu	Fri	Sat	Sun
FRESH	26	0	6	3	2	3	2	10
OK	16	0	16	0	0	0	0	0
BRED	81	8	2	17	31	5	9	9
MOVE	127	7	4	34	6	46	10	20
DRY	30	0	15	0	0	0	15	0
ABORT	5	2	2	0	0	1	0	0
SOLD	19	5	0	0	4	3	6	1
DIED	1	0	0	0	0	1	0	0
CULTURE	11	0	11	0	0	0	0	0
LAME	31	2	23	2	0	3	0	1
MAST	18	0	1	3	3	8	2	1
OFFFEED	4	0	0	0	0	0	4	0
PNEU	3	0	0	0	3	0	0	0
RP	4	0	0	0	0	4	0	0
INF	1	0	0	0	1	0	0	0
TREAT	3	0	0	0	0	3	0	0
TOTALS	380	24	80	59	50	77	48	42

We recommend setting this command in the Dairy Comp Task Scheduler to print weekly. It lists a summary of all of the events that have occurred in the last seven days. “Left clicking on one of the events will create a list of the animals.

Of course we will not see an pregnancies or opens as Dairy Comp associates those events with the breeding and we will not typically know the result of any breeding that occurred in the last week.

Cow Value is a function within Dairy Comp 305 that estimates the difference in the value of future production between each animal, and the average first calf heifer of she entered the herd today.

Animals are sold when a replacement will return more profit than keeping the animal. Some number of animals must be replaced each year or very definitely the productivity of the herd will go down as manifest by milk sales and reflected by average pounds of milk sold per cow per year, and average pounds of milk per milking cow per day.

If a herd had not culled animals appropriately then no amount of adjusting rations, improving comfort or adjusting milking routines will help increase a herd's productivity.

Cow Value, CWVAL and Pregnancy Value, PGVAL can help us evaluate the potential for increased culling within dairy. Both ITEMS are in units of dollars so an animal with a CWVAL of 700 is said to be worth 700 dollars more than replacing her with an average first calf heifer today. PGVAL is the dollar value of pregnancy in an animal. If the animal is not pregnant it is the amount you would add to her Cow Value if she becomes pregnant. If the animal is already pregnant, it is the amount you would subtract from her Cow Value if lost the pregnancy.

Three issues are closely interrelated and would be good to consider together in order to avoid confusing them.

- 1) Cull Rate – This a remainder – what is left after you manage your cows.
- 2) Disease incidence – The frequency with which animals are hurt by management problems. Disease is best measured directly by recording it when it occurs and then managing it directly, not through a surrogate such as cull rate.
- 3) Cow Value - The value of an animal relative to replacing her. The criteria by which an animal can be determined to sell. Whether you use the Dairy Comp calculations, or a feeling you get, it all comes down to an estimate of her likely future milk production. The greatest cow variables are, Age, Days in Milk, Reproductive Status, and her level of production. Some of the other variables are the cost of replacing an animal, (springer-beef price), expected production of replacement animals, and the likelihood of animals becoming pregnant within the herd.

Two important factors for using Cow Value

- 1) Keep assumptions updated
- 2) Have DC calculate it daily from task scheduler if it is going to be looked at on the Dairy.

3) Are you selling enough of the “right” animals?

Keeping low producers is the same as wasting capacity. Cow value can help determine the intensity of their culling.

COWVAL

Cow Value

Cow Value Item CVAL		Lact 1 CullRate	0.10
Pregnancy Item PGVAL		Lact 2 CullRate	0.35
Heat Detection	0.52	Lact 3 CullRate	0.45
Conception Rate	0.31	Lact 4 CullRate	0.55
Wait Period	60	Lact 5 CullRate	0.65
Avg Days Open	130	Lact 6 CullRate	0.70
Heifer Cost	1400	Lact 7 CullRate	0.75
Cull Value	350	Lact 8 CullRate	0.80
Milk Price/100	13.00	Lact 9 CullRate	0.90
Marginal Feed	3.00	Lact 1 305 Milk	20772
Maint Feed/day	1.50	Lact 2 305 Milk	23316
Discount Rate	0.10	Lact 3 305 Milk	24378
		Lact 1 Persist	0.96
		Lact 2 Persist	0.94
		Lact 3 Persist	0.92

Discount rate is the expected annual return a dairy should get on money invested today. It is usually slightly higher than the current interest rate. Range 0.02 to 0.2

Buttons: OK, Cancel, Use defaults, Restore Prev

SHOW ID LACT DIM PMILK MILK DSLH RPRO CWVAL PGVAL BY CWVAL FOR DIM>60
 CWVAL<0 RC>1

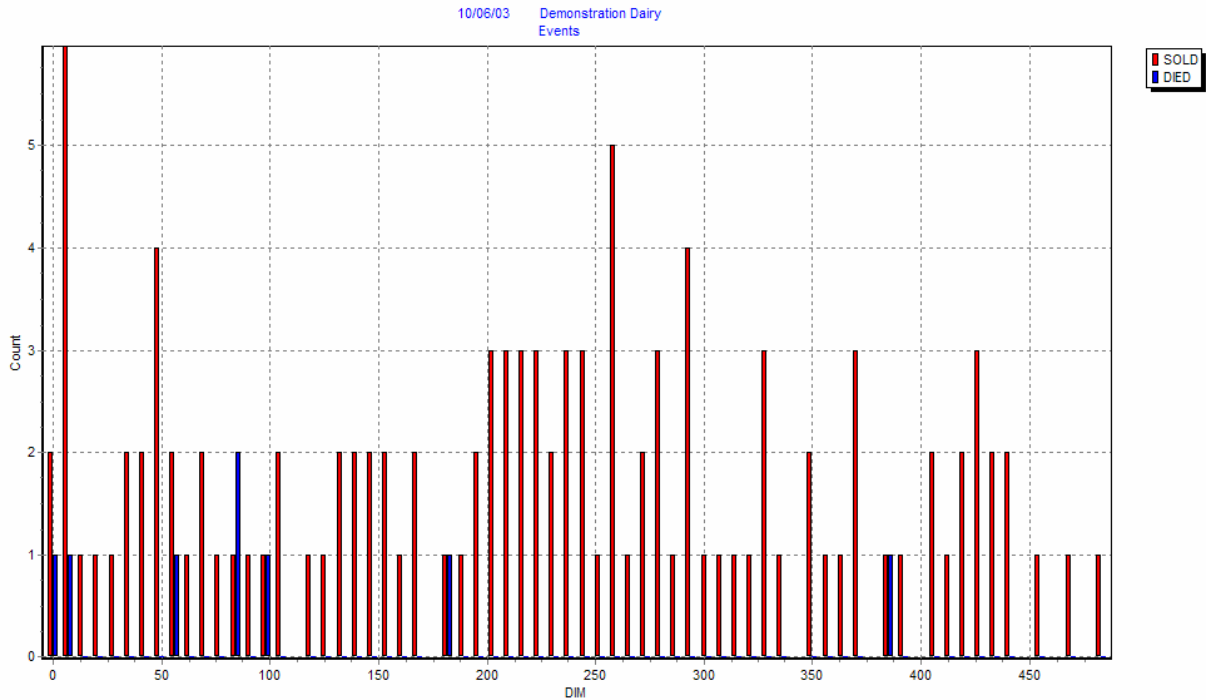
- Command : SHOW ID LACT DIM PMILK MILK DSLH RPRO CWVAL PGVAL BY CWVAL F								
ID LACT	DIM	PMILK	MILK	DSLH	RPRO	CWVAL	PGVAL	
3281	1	155	72	32	95	PREG	-486	-487
3173	2	131	103	36	21	BRED	-357	-263
3084	3	144	77	48	81	PREG	-339	-340
3144	2	167	71	62	29	BRED	-107	178
3167	2	115	78	65	14	BRED	-90	264
2901	4	67	54	79	18	BRED	-83	211
3187	2	93	77	68	0	OK/OPEN	-15	296
3189	2	97	75	68	0	OK/OPEN	-15	296

Total: 8

While this herd continues to keep a few strong candidates for replacement, there are not a lot of looser animals “clogging” up capacity and holding down the herd’s productivity.

When do animals leave the herd? Many animals leaving in early lactation can mean that they are not making the transition metabolically.

This EGRAPH (selecting sold and died, by DIM) shows there has not been a lot of animal loss in early lactation.



While the graph of sold and died animals by days in milk can indicate undiagnosed diseases it is a delayed method of looking for opportunity. We do not want to wait for animals to leave the herd to decide to intervene in animal health maintenance systems. Tracking disease incidence could bring us to an intervention decision months sooner than looking at animals leaving the herd.

Heifer Reproduction

BREDSUM\EY does the pregnancy rate for heifers

```

- Command : BREDSUM \EY
Date Ht Elig Heat Pct Pg Elig Preg Pct Aborts 25 50 75 100
=====
9/23/02 11 6 55 11 4 36 0 P H
10/14/02 11 7 64 11 2 18 0 P H
11/04/02 16 8 50 15 4 27 0 P H
11/25/02 19 9 47 19 6 32 1 P H
12/16/02 22 13 59 22 9 41 0 P H
1/06/03 22 17 77 22 5 23 1 P H
1/27/03 21 11 52 21 3 14 0 P H
2/17/03 21 15 71 21 8 38 0 P H
3/10/03 16 9 56 16 3 19 0 P H
3/31/03 18 11 61 18 5 28 0 P H
4/21/03 19 15 79 18 7 39 0 P H
5/12/03 17 8 47 17 2 12 0 P H
6/02/03 21 13 62 21 5 24 0 P H
6/23/03 24 13 54 24 11 46 0 PH
7/14/03 21 13 62 21 4 19 0 P H
8/04/03 21 12 57 19 2 11 0 P H
8/25/03 25 20 80 0 0 0 0 Undet Preg Stat
9/15/03 13 8 62 0 0 0 0 Undet Preg Stat
-----
Total 300 180 60 296 80 27 2 P H

```

27 percent pregnancy rate is pretty strong.

There are few heifers more than 12 months old not yet bred.

```

- Command : SHOW ID AGE FOR AGE>12 TBRD=0 FOR LACT=0 RC<>1
ID AGE
=====
3433 1-1
3515 1-3
3517 1-3
3518 1-1

Total: 4

```

```

- Command : SHOW ID AGE RPRO TBRD DSLH FOR AGE>15 DUE=0 LACT=0 RC<>1
  ID  AGE RPRO  TBRD  DSLH
=====
 3332  1-9 BRED    10   38
 3374  1-6 BRED     5    1
 3381  1-5 BRED     3   59
 3388  1-5 BRED     4   47
 3512  1-10 BRED     2   29

```

Total: 5

Heifer breeding is under control! Pregnancy rate is good, only two animals are over 13 months and not yet inseminated, and only 5 animals are more than 15 months, and not yet pregnant, and each of them are bred!

Summary of Reports (Monitor is not listed, but use it.)

Production

SUM DIM PMILK MILK MKDEV BY PEN FOR PMILK>0 DDAT=0\Z
GRAPH MKDEV PEN BY FDAT FOR MILK>0 FDAT>0 DDAT=0
PLOT MILK BY LCTGP\R
PLOT 305ME BY LCTGP\R
GRAPH ME1 BY FDAT LCTGP FOR FDAT>-365\BR

Daily Milk Weights for tracking Fresh Cows

GRAPH MAVG by DIM LCTGP FOR FDAT>-30
SUM MAVG MTOT MDEV BY LCTGP FOR FDAT>-30 MTOT>0\Z
GRAPH MDEV BY DIM LCTGP FOR FDAT>-30
EXAM\6 FOR FDAT>-30 MDEV<-5 review lactation page for “down” fresh cows.
SHOW ID PEN DIM MAVG MTOT MDEV FOR FDAT>-30 MDEV<-6 BY MDEV
SHOW ID DIM MILK EASE EVT REM EDAY LACT BY DIM DOWNBY FDAT
FOR FDAT>-30\B Look at all recently fresh cows including those sold

Transition

GRAPH FAT1 BY FDAT LCTGP FOR FDAT>-365\BR
PLOT PCTF BY LCTGP\R
GRAPH MILK BY DIM\R
SHOW ID DIM MILK EASE EVT REM EDAY LACT BY DIM DOWNBY FDAT
FOR FDAT>-30\B

Reproduction

BREDSUM\E
BREDSUM\ED150
PLOT BRED\SRT300
PLOT BRED\W1D200R
SHOW ID DIM LACT FOR DIM>70 TBRD=0 RC>1

Disease

ECON\ID (Historical overview by week)
EVENTS\5 (Table by Month)
EVENTS\5S7W (Current week’s Events)

Udder Heath

PLOT LS BY LCTGP\R
GRAPH LOG1 BY FDAT LCTGP FOR FDAT>-365\BR
PLOT LS=4 BY LS\RY
SUM DRYLS=4 LS1=4 FOR DRYLS>0 LS1>0 FDAT>-365

Culling – is it adequate?

COWVAL

SHOW ID LACT DIM PMILK MILK DSLH RPRO CWVAL PGVAL BY CWVAL
FOR DIM>60 CWVAL<0

EGRAPH sold and dead events by DIM

Replacement Rearing

BREDSUM\Y

SHOW ID AGE FOR AGE>12 TBRD=0 LACT=0 RC<>1

SHOW ID AGE RPRO TBRD DSLH FOR AGE>15 DUE=0 LACT=0 RC<>1

EPlot then select BRED and check Heifers, Scatter, and Remark boxes

Some other monitoring points

Number of animals calved with EASE>2 (for fdat>-30 ease>2)

Number animals sold <50 days in milk (for fdat>-50 ardat>0\d)

Selected Dairy Comp 305 Items and Their Definitions

Name	Loc/Op1	Len/Op2	Type	Description
ME1	1	0	86	First Test Day ME
305ME	-1	0	86	Projected 305 milk production
BRED1	BRED	1	71	DIM at first breeding
DIM	DDAT	FDAT	49	Days in milk
DSLH	Today	HDAT	49	Days since last heat/ breeding
EASE			1	Calving Ease
FAT1	1	0	83	First fat test
FDAT	71	2	18	Fresh (calving) date
LCTGP	LACT	3	109	lactation group
LOG1	1	1	88	Linear score first test
LS	-1	1	88	Log or Linear somatic cell
LS1	1	1	88	First testday LS
AVLS	50	1	88	Average linear score
DRYLS	122	213	1	8 Linear Score at dry off
EMILK	202	1	1	Expected Milk
PMILK	-2	0	82	previous test day milk
MILK	-1	0	82	Last test day milk weight
MKDEV	203	1	7	Deviation from expected milk
CWVAL	204	2	16	ESTIMATE of cow value vs hfr
PGVAL	206	2	16	ESTIMATE of value of pregnancy
PLS	-2	1	88	Previous test SCC Linear Score
RATIO	PCTP	PCTF	110	Ratio %Prot to %Fat
PCTF	-1	0	83	Last test date % fat
PCTP	-1	1	83	Last test date %solids/prot
PEN	2	1	1	Pen number

Note that items similar to these may be in your cowfile under a different name. You can also add these items to your cowfile using the definitions listed.