Dairy Comp and Using Milk Test Results

12.06

Fat, Protein and Somatic Cell information can be helpful in making decisions on individual cows, and in determining if management changes may be positively or negatively affecting the herd.

- Evaluate individual animals for infection and gauge their impact on the bulk tank
- Track the udder infection dynamics using SCC Linear Score changes across your herd.
- Track animal health and diet changes using Fat to Protein ratios.

Udder Health

1) High SCC cow list
2) Bulk Tank Impact
3) Infection Dynamics (Milking Herd)
4) Dry Period Infection Dynamics

A high SCC Linear Score means an animal is likely to have a mastitis infection. The higher her Linear Score, the more likely she is infected. By convention, an animal with a Linear Score of 4 or greater is considered "infected". See Appendix V for more information on the relationship between raw SCC and SCC Linear Sores. Appendix II will display item definitions that may not be in your cowfile.

1) Make a High SCC list to make decisions on infected cows. One example follows.

```
LIST ID PEN DIM MILK NMAST LMAST RMAST RPRO DSLH DRYLS LS1 PLS LS
          DOWNBY LS FOR LS>4
```

ID	PEN	DIM	MILK	NMAST	LMAST	RMAST	RPRO	DSLH	DRYLS	LS1	PLS	LS
368	10	221	49	6	1/31/06	SPC5RH	PREG	150	0	7.2	4.0	9.6
2665	1	201	66	12	1/25/06	ALBON	BRED	36	7.3	4.4	4.8	9.6
2881	10	407	29	4	1/31/06	PIR5LH	PREG	155	2.4	1.4	5.0	9.6
105	10	175	85	5	1/31/06	SPC5ALL	PREG	109	5.0	6.5	5.8	9.4
2732	4	212	82	1	10/ 5/05	SPC3LH	BRED	21	6.2	9.2	5.1	9.3
2837	5	224	97	1	11/ 1/05	SPC3RH	BRED	9	2.0	3.1	3.6	9.3
408	3	18	0	0	-	-	FRESH	0	0	9.0	0.0	9.0
2914	10	192	98	4	1/31/06	PIR5LH	BRED	24	1.7	2.6	5.8	8.7
216	1	290	52	2	1/16/06	PIR5RH	OK/OPEN	46	0	2.1	4.0	8.4
267	8	308	64	1	11/27/05	SPC3RF	BRED	17	0	2.2	4.9	8.4
2899	7	298	43	1	1/11/06	ALBON	DRY	241	3.1	0.5	3.1	8.2
2971	5	228	71	0	-	-	PREG	79	4.5	5.8	5.4	8.0
243	1	337	73	1	1/12/06	ALBON	BRED	22	0	2.6	6.8	7.9
2405	4	166	93	0	-	-	BRED	5	9.4	5.4	7.9	7.8
2276	1	401	49	0	-	-	NO BRED	0	4.7	3.4	5.4	7.7
2946	5	268	81	1	9/29/05	AMO3RF	PREG	45	4.1	3.7	7.4	7.7
516	99	19	0	0	-	-	FRESH	0	0	7.4	0.0	7.4
1951	2	74	99	0	-	-	BRED	3	7.1	5.4	5.4	7.4
2888	1	252	101	5	1/10/06	PIR5RF	BRED	33	4.8	4.7	4.8	7.4

This is a list that includes some production, clinical mastitis, and SCC LS information to help you determine if animals are chronic problems or new problems, if their clinical mastitis is cleared up following a treatment, and then consider what actions to take. These values will fill in as you test more for SCC.

Some questions to ask yourself as you look at animals on this list. Is this a new infection, or is the problem recurring. What is her most recent clinical, and did she clear up after treatment? Is this an infection she has carried through the dry period?

It is common for an animal to have a sudden high count on test day, and then her immune system cure the infection by the time you make this list. Be cautious in taking an action on a cow with only one high SCC count.

Some Actions to consider:

- Make her a Do Not Breed animal
- CMT to identify problem quarters
- Culture and then possibly treat (It is not recommended to treat animals without culture results as only certain infections respond profitably to treatment and many may already be taken care of by the animals' immune system).
- Dry off early
- Sell now

2) Bulk Tank Impact

```
Dairy Comp Command >  ECON\S

Analyzing 1772 cows on Test Date  5/10/06

|-- Bulk Tank Today --|
Total Milk   155911          |--------- Current Settings -----|
Average Milk     87          Milk price   11.75
Bulk PctF      2.98          Fat Base       3.5     Diff  0.15
Bulk PctP      2.85          Ptn Base       3.2     Diff  0.12
                             SCC Premiums enabled

Without any cows removed :        Bulk Tank SCC     288
                                  Pay Price       10.79
                                  Daily Income  16822.80

                                | Bulk Tank after     | Bulk Tank after    |
                                | removing only this  | removing cow and   |
                                | cow from tank       | all cows above it  |
 ID   MILK  Value   SCC  %Tank  | Price @SCC  Income  | Price @SCC  Income |
===== ====  =====  ====  =====  | ===== ==== =======  | ===== ==== ======= |
1024   109  11.50  9999    2.4   10.78  281 16792.34   10.78  281 16792.34
2609    96  10.12  9999    2.1   10.79  282 16812.44   10.79  275 16800.68
819     91   9.60  9999    2.0   10.79  282 16812.98   10.79  269 16790.86
1679    82   8.65  9999    1.8   10.79  283 16813.95   10.79  264 16782.01
391     77   8.12  9999    1.7   10.78  283 16795.79   10.78  259 16755.05
450    126  13.28  6041    1.7   10.78  283 16790.51   10.78  255 16741.47
151     85   8.96  8323    1.6   10.78  283 16794.93   10.78  250 16732.31
1021   104  10.96  6747    1.6   10.78  283 16792.88   10.78  246 16721.10
7513   125  13.17  5243    1.5   10.79  284 16809.31   10.78  242 16707.62
1384    72   7.59  8155    1.3   10.79  284 16815.03   10.78  238 16699.86
7828    80   8.43  7157    1.3   10.78  284 16795.47   10.78  235 16691.24
2336    87   9.17  6275    1.2   10.79  284 16813.41   10.78  231 16681.87
164     63   6.64  8033    1.1   10.79  285 16816.00   10.78  228 16675.07
625    103  10.85  4578    1.0   10.79  285 16811.68   10.78  225 16663.97
236     45   4.74  9999    1.0   10.78  285 16799.24   10.78  222 16659.12
670     94   9.91  4771    1.0   10.78  285 16793.96   10.78  220 16648.99
7041    90   9.48  4126    0.8   10.79  286 16813.09   10.78  217 16639.29
```

This report lists animals in the order that they impact the SCC in the tank.

The top part of the report displays the theoretical tank SCC of 288,000 worth 16,822 per day based on the entered milk pricing. The milk pricing portion is seldom used – people do find the impact on the tank of interest.

Animal 1024 is contributing 2.4% of the tank's SCC. If she was removed the new theoretical tank would be 281,000 SCC. The first column shows the impact of any one cow, the second column, on the right, shows the impact of withholding that animal, and all animals above her.

Economically – it can be risky to withhold an animal from the bulk tank as the value of her milk may not offset any gains in premiums and her actual infection state any give day will vary as her immune system fights the infection.

3) Herd Infection Dynamics

```
Command  : PLOT LS=4 BY LS\RY
```

DCFARM1 ---------- Dairy One ---------- 1/16---

		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	15	19
	#	52	63	66	67	78	78	80	71	76	86	64	72	90
New Inf	%	8	9	6	10	9	13	6	12	12	10	12	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	41	19	33	20	25
	#	21	9	11	15	23	24	16	25	14	6	16	10	17
LoFresh	%	81	84	82	76	62	68	70	54	59	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	571	540	518	519	547

This is the report seen when you click the report tab (the tab between Grid and Graph towards the bottom of the screen) after running the command, (the graph tab will be displayed first).

Across the top are test dates. The most recent test is 1.16 and the previous test date is 12.19.

Based on the way we ran this command, animals are considered infected if they have a SCC Linear Score, (LS) greater than 3.9. if they are 3.9 or less they are considered uninfected.

On 1/16 – the last test listed

19 percent of the herd, or 90 animals were high last month and this month, and are considered chronically infected.

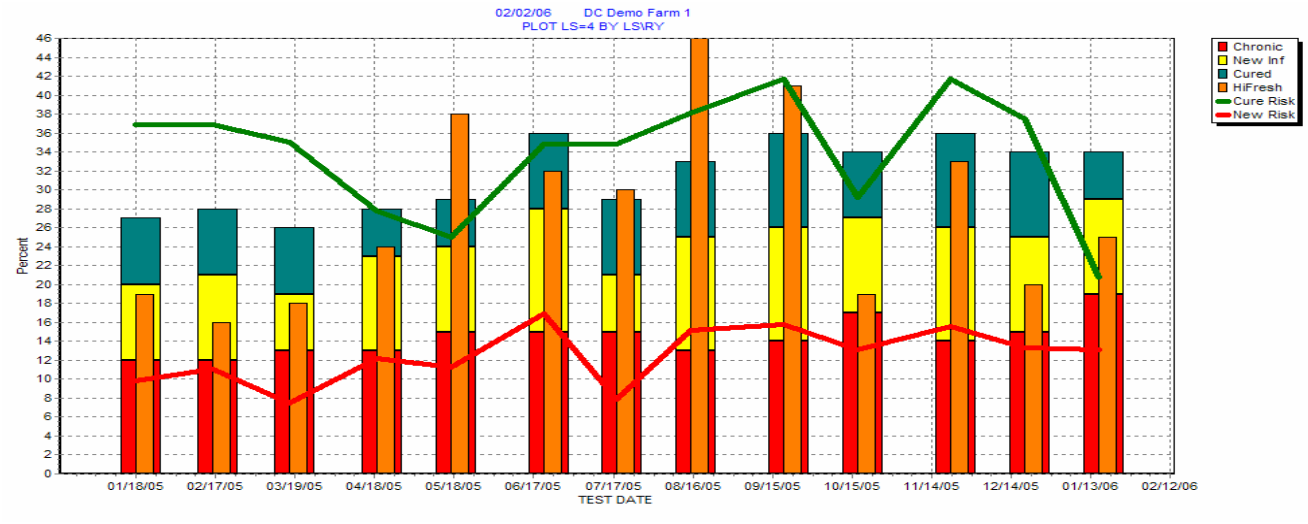
10% or 49 animals, were newly infected, meaning that they were low last month and are high this month.

5% or 22 of the animals were cured, meaning they were high last month, and are low this month.

25% of the fresh cows, were high this, their first test after calving, and 75% were low.

The current overall average Linear Score is 3.0 on 547 animals, up from 2.7 the previous month.

The graph tab (left click on the graph tab below) shows this information in a picture with two additional bits of information.



As the herd tests more times this graph will fill in with a stacked bar for each month as shown above. The red (bottom section shows the chronic level of infection in the herd. Note that your first month there not any chronically infected animals, because we did not have a previous test SCC. The yellow (middle) section are the newly infected animals the blue, top section shows the cures.

Two new bits of information on this are the cure risk, (green, top line) and new risk, (bottom, red line). The Cure Risk is the percentage of eligible animals that became cured (IE the percentage of animals that were infected last month and became uninfected this month). The New Risk is the percentage of animals that were not infected that became infected this month. If you "click" on the line it will show you the actual numbers.

Consider rerunning the report with the command `PLOT LS=4 BY LS\RY FOR LACT=1` to evaluate your just your first lactation animals.

4) Dry Period Infections

The Dry Period is the single most critical time for animals to get infected with Mastitis. It is also one of our greatest opportunities for cleaning up a sub clinical infection. So what is happening on this dairy?

First, confirm you have the Items DRYLS and LS1. (See appendix 1 for definitions).

Secondly, if not already being collected, change the DRY command to include DRYLS=LS

Thirdly, if not already present initialize the values with the command EVENTS\7S DRYLS.

Compare how animals calved relative to drying off.

New Infections	*Percentile	Dry Cow Cures
<7%	90th	>82%
23%	Average	58%
>40%	10th	<32%

** University of Wisconsin School of Veterinary Medicine staff from the AgSource Transition Cow Index Fresh Cow Summary Benchmarks*

```
SUM DRYLS=4 LS1=4 FOR DRYLS>0 LS1>0 FDAT>-365\B
```

This command asks FOR animals that have both a DRYLS and LS1, with a Fresh Date in the last 365 days, and the \B makes sure we include animals that have left the herd.

```
 Command  : SUM DRYLS=4 LS1=4 FOR DRYLS>0 LS1>0 FDAT>-365\B

  ------------- Dairy One ------------------ 4/20/06---

                        LS1 |     LS1
                       <4.0 |   >=4.0
         DRYLS           76 |      24    100
         >=4.0          17% |      5%    22%
                  --------+--------
         DRYLS          276 |      62    338
          <4.0          63% |     14%    77%
                 ==========================
                        352        86    438
                        80%       19%   100%
```

This creates a “2x2”comparison table showing the various combinations of how animals dried off, and how they calved.

Animals below the horizontal line dried off “uninfected”, and those above the horizontal dried off “infected”.

Animals represented on the left of the vertical had a first test day “uninfected” and those on the right, were “infected” on their first test day.

In this example:

63% of the animals dried off low and calved low
17% dried off high and calved low
80% of the animals came through the dry period “uninfected”

5% dried off high and calved high
14% dried off low and calved high
19% came out of the dry period infected

After looking at this for the last year consider changing the FOR statement by adding FDAT>-180 to look at the animals that calved in the last 180 days.

If you wish to look at a specific dry period you can make the FOR statement control it by dry date with FOR DDAT=11.1.05-2.1.06 (for example) would run the summary for animals that dried off from 11.1.05 through 2.1.06.

Monitoring animal health and nutrition changes with Fat and Protein

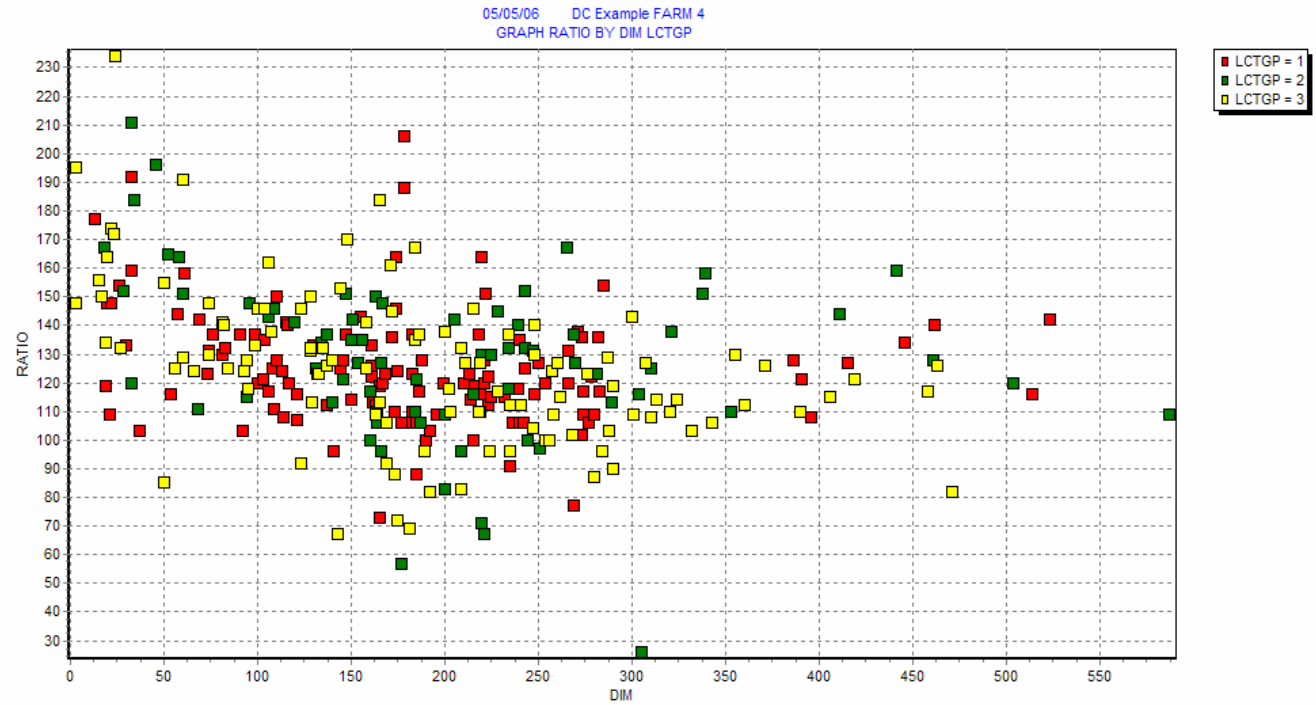
Use the Item ratio to summarize the portion of the herd with a Fat to Protein of ratio less than 100. These are also known as Fat and Protein "inversion" animals.

```
- Command  : PCT RATIO<100 FOR RATIO>0 BY PEN

            PEN  PCT  Count Total
---------------  ---  ----- -----
              1    2      2    83
              2    4      3    61
              3   16     14    83
              4   11     10    84
===============  ===  ===== =====
          Total    9     29   311
```

In this example, 9 percent of the herd has a fat to protein ratio of less than 100 this month, (the percent fat is lower than the percent protein) with 2 percent of pen 1 low, and 16 percent of pen 3 low.

Consider adding % "Low" Ratios to your Monitor report so you can track the herd monthly.

`GRAPH RATIO BY DIM LCTGP` gives another way to look at Ratio.



Notice the low RATIO animals between 150 and 300 days in milk. Also notice the high ratio animals in early lactation. A very high fat percentage in early lactation may be caused by ketosis.

Fresh Cows with a High Fat test

```
Command  : PCT PCTF>5 FOR DIMTD=5-35 PCTF>0

 PCT  Count Total
 ---  ----- -----
  29      7    24
```

In this herd, this month, 29%, or 7 of 24, of the Holsteins that are less than 35 days in milk and have a current fat test have a fat percentage greater than 5. Watching this over time, could give a sense if the animals are starting out healthier, even before you can detect a change in clinical disease.

Appendix I Using Monitor

To begin tracking changes in Ratios of your milking herd Monitor can be configured as displayed below. Add the constraints as listed below, or of course call the support line for help. An absolute value for any of these may not be as important as when you see a significant change.

The Monitor Configuration

```
30 %Ratio<100         0 Pct       L RATIO<100             RATIO>0
31 %FreshHiFat        0 Pct       L PCTF>5.0              PCTF>0     DIM<35
32 %FreshLwFat        0 Pct       L PCTF<3.0              PCTF>0     DIM<35
```

The Monitor display (just one month is shown)

```
# Parameter              0505 Goal
==================       ==== ====
29      POST-RECV  ---------------
30 %Ratio<100              9    0
31 %FreshHiFat            29    0
32 %FreshLwFat             7    0
```

Appendix II

Items of interest:

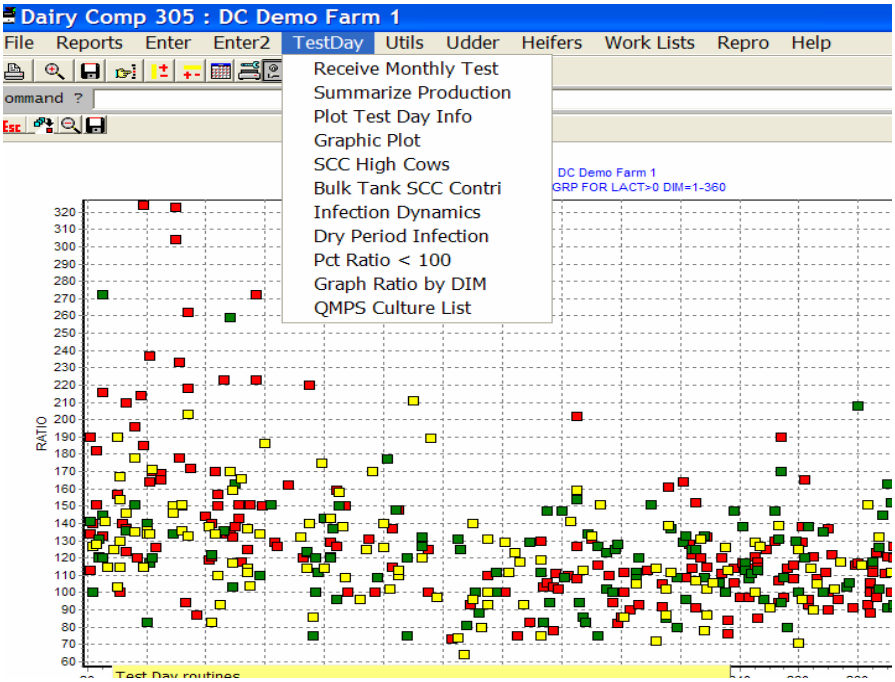
```
Name     #  Loc/Op1 Len/Op2 Type Description                    (Alternate Name)
======= === ======= ======= ==== ================================
AVLS    153      50       1   88 Average linear score
DRYLS   180     112       1    8 Linear Score at dry off         (DRYLOG)
LS       99      -1       1   88 Log or Linear somatic cell
LS1     181       1       1   88 Linear score first test          (LOG1)
PLS     112      -2       1   88 Previous test SCC Linear Score
SCC      49      -1       0   88 Last test raw somatic cell count

RMAST   104    MAST      -1   73 Remark of last mastitis event
LMAST   103    MAST      -1   70 Date of last mastitis event
NMAST   102    MAST           74 Number of mastitis events

PCTF     54      -1       0   83 Last test date % Fat
PCTP     53      -1       1   83 Last test date %Protein
RATIO   186    PCTF    PCTP  110 Ratio of Fat to Protein

MUN     196      -1       0   84 mun score last test
LCTGP   151    LACT       3  109 lactation group
```

Appendix III

Commands you may want to save

```
Abbrev  Content
======= ================================================================
DRYINF  SUM DRYLS=4 LS1=4 FOR DRYLS>0 LS1>0 FDAT>-365\B
DRYITEM ID PEN RPRO LACT MAVG DIM TBRD TRIM DCC SCC ID
HIGHSCC LIST HIITEMS DOWNBY LS FOR LS>5
HIITEMS ID PEN DIM MILK NMAST LMAST RMAST RPRO DSLH DRYLS LS1 PLS LS
SCCDYN  PLOT LS=4 BY LS\RY
RATIOGR GRAPH RATIO BY DIM LGRP FOR DIM=1-365
RATIOLO PCT RATIO<100 FOR RATIO>0 BY PEN
```

Appendix IV Testday Menu



Adding the common functions to the Testday menu will make it easy to recreate the same reports each test day.

Appendix V

Linear Scores vs Raw SCC

When you are managing the Bulk Tank you must think in terms of SCC. When you are managing cows it is best to think in terms of the Somatic Cell "Linear Score".

LS	SCC (thousands)	
2	50	
3	100	
4	200	Generally accepted as the point where animals can be considered infected.
5	400	
6	800	
7	1,600	
8	3,200	(This is 3,200,000 cells per milliliter)

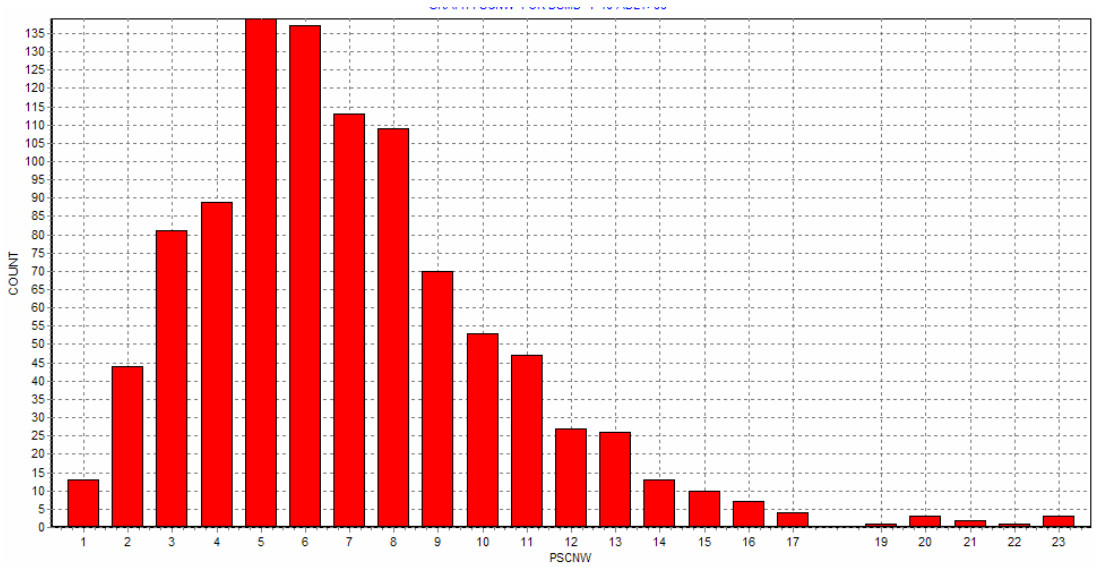
Notice that when the Linear Score changes by one, the SCC either doubles or halves.

To understand why LS is better for working with cows look at the example cow who had 9 low tests, and had one test she "popped" up in SCC. The average LS better characterized the quality of the animal's udder health, than the average Raw Count.

Example Cow

Test	LS	SCC
1	2	50
2	2	50
3	2	50
4	9	6,400
5	2	50
6	2	50
7	2	50
8	2	50
9	2	50
10	2	50
avg	2.7	685

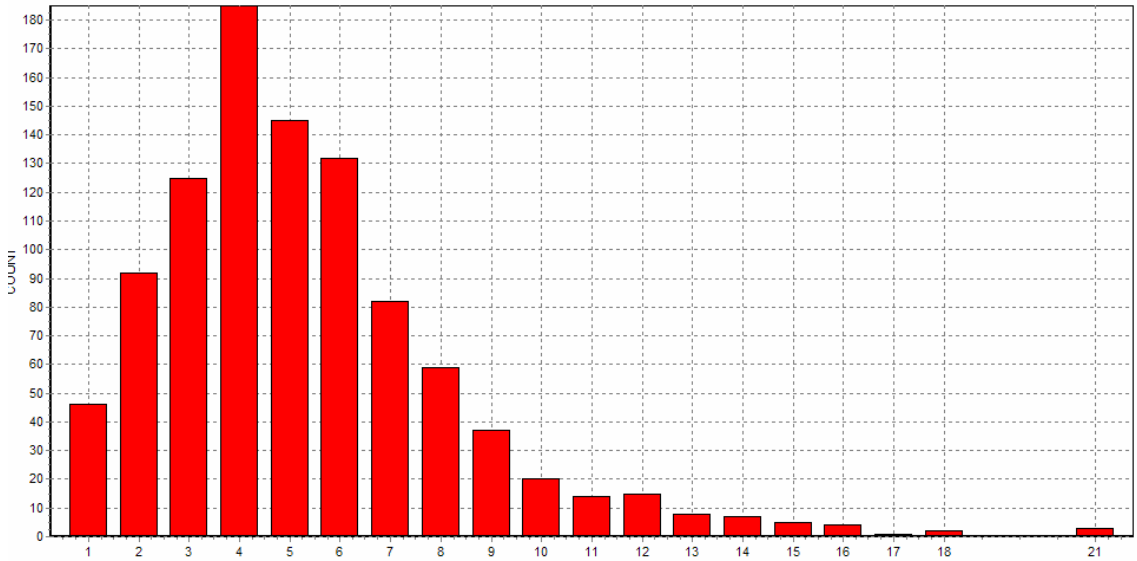
Percent new infections



Above is a histogram showing the distribution of 1006 herds, with more than 99 cows that tested in June of 2006, by percent new infections. The average percent of animals newly infected was 7% with a Standard deviation of 4.

It is pretty easy to see that 5% or 6% is the most common rate of new infections.

Percent Cured from the same set of herds.



The most common rate of cures was 4% with an average of 5% and standard deviation of 3.