WisGraph 8.0 Interpretive Manual

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Introduction to the Graphs

The graphs are generated from herd DHI data from AgSource and downloaded through the DairyNet system. They have been developed to present herd-level information about the productivity and health of dairy herds. There are several three basic styles of graphs, as described below.

Line graphs over time

Most of these graphs show a herd summary trend over the past 24 DHI test dates and usually summarize a period of two years. However, in cases where the dairy does not test on a monthly basis, the time span of the graph can exceed the expected time period. Check the dates on the graphs routinely.

Checking the current herd performance against performance at the same month a year ago is often a useful test to measure progress. It removes the effect of season from the interpretation of the graph.

Occasionally, data errors appear after downloading from DairyNet. If values are received that are clearly out of the normal range, we recommend that you repeat the DairyNet request and download process. If the values remain abnormal, call AgSource and ask them to investigate the herd data file.

Scatter plots

The scatter plots are generated from individual cow data. Each dot usually represents one single cow. These graphs make it possible to look at variation within the herd.

Scatter plots may be useful in looking for outlier data points. Outliers would represent cows that have produced an extreme value that might have a substantial effect on a calculated average.

Several of the scatter plots show a performance value plotted against the current days in milk of the cow. Special attention should be paid to the graphs that plot “peak milk” and “ME305” against days in milk. We have developed these graphs to try to assess current performance of the early lactation cows, as the “herd-level” graphs of these items include the average of the entire

lactating herds and respond relatively slowly to changes in fresh cow performance. These plots require careful and cautious interpretation as there may be effects of season, stage of lactation, and management at play simultaneously and may be confounded by small populations of animals of different productive capability.

It is usually very difficult to evaluate a scatter plot in any quantitative way. Because of this, a regression line and formula is generated automatically in some of the graphs. With a large number of data points, the regression usually helps describe the central tendency of the data. However, individual points that lie far outside the general cluster can skew the regression, so take care in the interpretation.

The regression formula explains the relationship between the two variables on X and Y. The r^2 value indicates how much of the variation in "y" is explained by variation in "x". For example, if the r^2 of Sire PTA milk on ME305 milk of individual cows is 0.25, it means that the sire PTA milk explains about 25% of the variation in the cow's ME305 milk production.

The regression formula is based upon the standard Y = aX + b, where b is the intercept of the Y axis and a is the constant. For example, if the regression formula in the Sires PTA milk versus Cow ME305 milk appears as y = 1.01 x + 25,000, this indicates that for each pound of Sire PTA milk the daughters produce 1.01 lbs of ME305 milk.

Histograms

Several of the graphs are displayed as histograms where each bar represents the number of animals that are characterized by some range of values. Some histograms will display a "normal" bell shaped curve and these populations are well described numerically by a mean (average) and standard deviation. Other histograms such as days to first breeding are skewed to the right and the central tendency is best described by the median value.

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Graph: 2-Size Adult Cow Numbers

Purpose:

To monitor size trends of total herd numbers, dry and lactating cows, and first and second and greater parity groups.

Interpretive Comments:

In a stable herd with year-around calving, approximately 15% of the herd is expected to be dry.

With average turnover rates in an established herd, 35% of the herd is expected to be first lactation.

Questions:

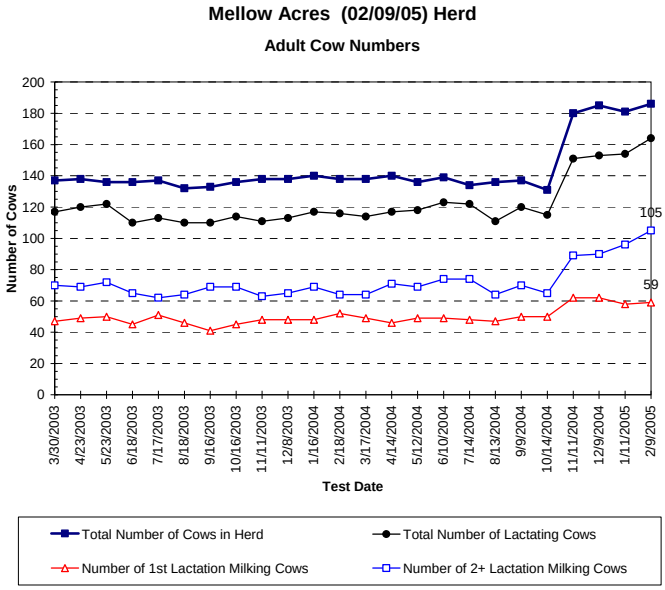
1. Note absolute herd size. Is the herd size stable, increasing or decreasing?

2. What is the approximate % of the herd that is first lactation cows?

3. If herd has expanded, was the expansion done with first lactation or older cows?

4. What is the approximate % of the herd that is dry cows? Is the % relatively constant or highly variable in this herd?

2-Size Example Herds:

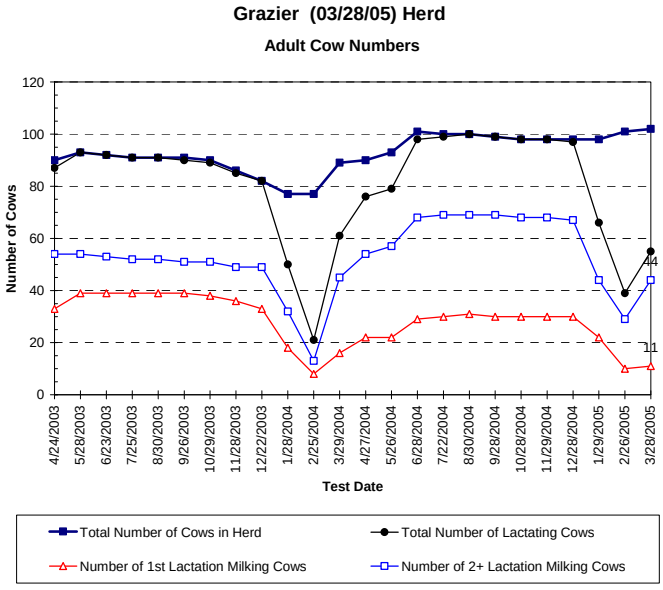


Average Number of Animals in herd (last 12 months) = 151

Percent 1st Lactation Cows in milking herd on last test = 36

Percent Dry Cows on last test = 12

Number of tests in last 12 months = 13



Average Number of Animals in herd (last 12 months) = 97

Percent 1st Lactation Cows in milking herd on last test = 20

Percent Dry Cows on last test = 46

Number of tests in last 12 months = 13

"Mellow Acres" has increased herd size from about 135 cows to over 180 in the last 5 months. While many herds expand with only heifers, this expansion was completed in a single month and was done primarily with mature cows and relatively few first lactation cows. The proportion of dry cows at 12% of the herd is currently less than on a typical dairy. It may be the result of purchasing lactating cows only.

"Grazier Dairy" tries to establish a seasonal dairy to match the grass growth curve. Many cows that do not fit the calving window of mid-March to May are sold from the herd as replacement cows to other farms. The proportion of dry cows is highly variable from month to month because of the seasonal calving.

Graph: 3-Cull Turnover Summary (Last 12 Months)

Purpose:

To summarize the numbers and parity groups of cows entering and leaving the herd, as well as the reported reasons for their removal.

The box in the lower right contrasts the number of cows culled for each reason in your herd compared to the industry average number of culls in an equivalent sized herd. If the cull codes are used, it is a convenient way to identify herd success and problem areas.

Interpretive Comments:

Turnover rate equals number of cows leaving the herd divided by the rolling average number of cows in the herd.

Average annual turnover rate equals 37%, while goal annual turnover rate equals 25%.

For first lactation animals entering the herd, the goal is that less than 25% are culled in the first year.

The stated reason for culling is reported by dairy operator and is very subjective. For example, a cow may have several problems such as a high SCC and 200 days open before becoming pregnant. While each reason contributes to her removal, the operator has to choose one answer.

Some dairy operators report a default reason such as low production for all cows and do not complete reasons on an individual cow basis.

In an average herd, reproduction is the most common reason for culling, followed by mastitis.

Questions:

1. Review the in/out numbers. Did the herd expand or contract in the period of the last 12 tests?

2. What proportion of culls were first lactation cows? Of the first lactation cows that entered, approximately what proportion left the herd in the last 12 tests?

3. Did any mature cows enter the herd in the last year?

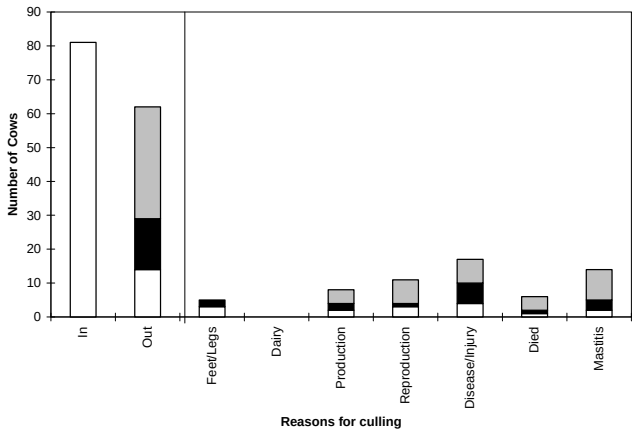
4. The coding for cull reason may be erroneous due to subjectivity, multiple reasons, and sometimes default values in software conversions. Are the reasons for removal distributed across a plausible range?

5. Are there any categories where culling is much lower or higher than industry averages?

3-Cull Example Herds:

Sand Stall Dairy (11/04/02) Herd

Turnover Summary (Last 12 Months)



Average Number of Animals in herd (last 12 months) = 237

Turnover Rate (last 12 months) = 26

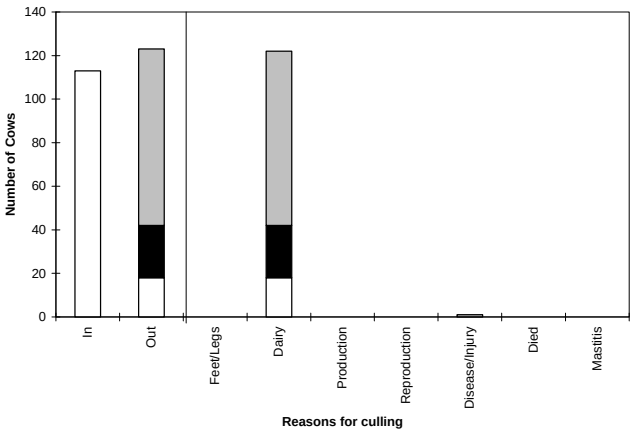
Number of tests in last 12 months = 12

This table compares your herd culling reasons to industry averages, applied to a herd equal in size to yours.

Culling Reason	Industry Ave	Your Herd
Turnover rate	37%	26%
Total, # cows culled	88	62
Feet/Legs, # cows	7	5
Dairy	5	0
Production	11	8
Reproduction	17	11
Disease/Injury	24	17
Died	12	6
Mastitis	13	14

Mattress Dairy (12/28/02) Herd

Turnover Summary (Last 12 Months)



Average Number of Animals in herd (last 12 months) = 309

Turnover Rate (last 12 months) = 40

Number of tests in last 12 months = 10

This table compares your herd culling reasons to industry averages, applied to a herd equal in size to yours.

Culling Reason	Industry Ave	Your Herd
Turnover rate	37%	40%
Total, # cows culled	114	123
Feet/Legs, # cows	9	0
Dairy	6	122
Production	15	0
Reproduction	22	0
Disease/Injury	31	1
Died	16	0
Mastitis	17	0

"Sand Stall Dairy" has a turnover rate of 26%, very close to optimal. The distribution of stated reasons for removal appear to be rational and lower than industry averages in all categories except mastitis, which might be the next bottleneck to investigate as a herd health manager.

All cows entered the herd as first lactation cows.

"Mattress Dairy" reports a slightly higher turnover rate than the industry average, and more cows left than entered in the past year. All cows entering were first lactation cows. The stated reason for removal is "dairy", suggesting that the cows were sold as milk cows to other dairy farms. However, that is not the case. The software interface between "on-farm" DairyComp records and DHI sometimes converts various reasons to a default "Dairy" reason for removal.

Graph: 4-DimCull Days in Milk Distribution of Culled Cows

Purpose:

To monitor the stage of lactation when cows are removed from the herd.

Interpretive Comments:

The histogram represents all cows that were sold or died in the past year.

The y-scale indicates the percent of the herd, not the % of culled cows, that are removed during each 30-day interval. Please note that the range of the y-scale varies from graph to graph. While the y-scale reports % of herd, the number above each bar reports the total absolute number of cows removed in each period. The white lower portion of the bars indicates culled first-lactation cows and the gray upper portion represents cows in their second or greater lactation.

Cows removed from the herd in the first 30 days-in-milk usually represent fresh cow disease problems. These are also very costly because the cow will have been housed and fed through the dry period or through the heifer raising years, only to produce milk for a few weeks.

Our data suggests that the average herd removes about 9% of all cows in the herd within 60 days of calving, with a range from about 2-17%. The lowest removal quartile is less than 6%, and the highest quartile starts at over 12%. High removal rates in this period usually reflect problems with transition cow management.

Cows removed from the herd at greater than 450 days-in-milk usually represent good producing cows that are sold because of reproductive problems. Our data suggests that the industry removes about 4% of all cows after 450 DIM, with a range from about 2-7%.

Questions:

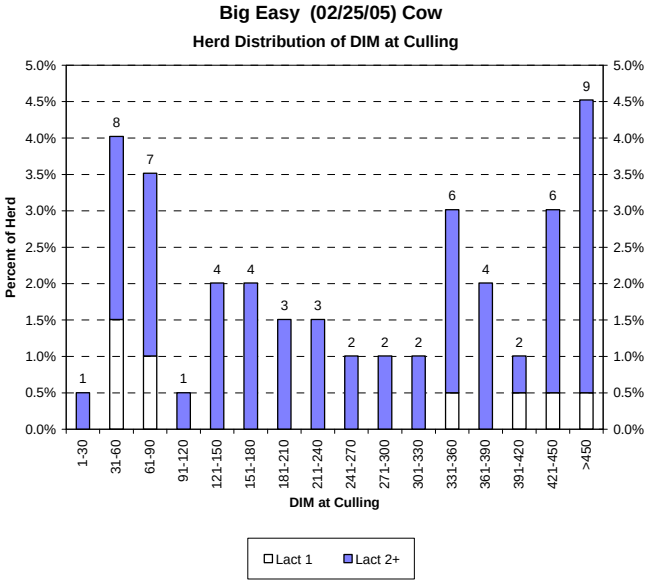
1. Is the removal rate during the first 60 days after calving higher or lower than the industry average?

2. What factors could be influencing the rate?

3. What is the rate of removal from the herd at 450 days in milk or greater?

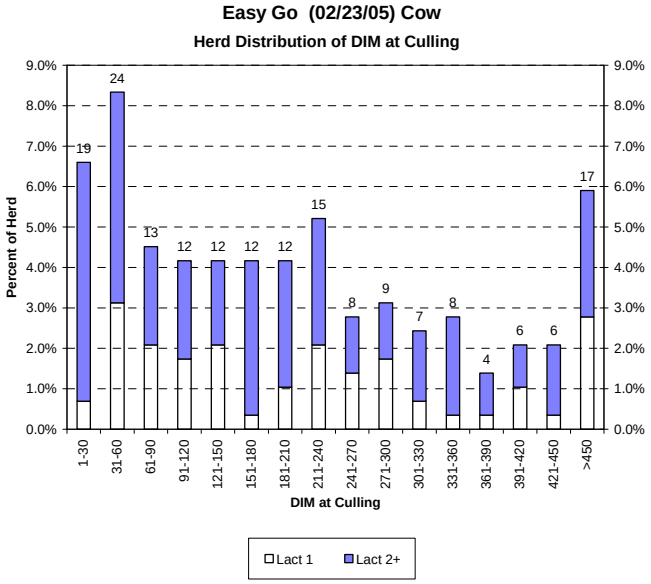
4. If higher than average, does the herd also have poorer overall reproductive performance than average? If lower, does the herd have better overall reproductive performance?

4-DimCull Example Herds:



Median DIM at Removal = 247

	Your Herd	Industry Average		
Turnover Rate <60 DIM		Top Quartile	Average	Bottom Quartile
All	5%	<6%	9%	>12%
1st Lact	2%			
2+ Lact	3%			



Median DIM at Removal = 193

	Your Herd	Industry Average		
Turnover Rate <60 DIM		Top Quartile	Average	Bottom Quartile
All	15%	<6%	9%	>12%
1st Lact	4%			
2+ Lact	11%			

"Big Easy Dairy" removed 4.5% of their cows within the first 60 DIM, which puts them in the best quartile of the industry. The dairy has excellent dry cow management and fresh cow health.

The 4.5% removal rate at greater than 450 DIM is approximately industry average.

"Easy Go" removed almost 15% of all calving cows within the first 60 days after calving, many of which died. The manager should work with advisors to identify the reasons for sick and injured fresh cows and take corrective actions.

The 6.0% removal rate after 450 DIM is also higher that average for the industry and usually reflects a higher than average rate of culling for reproductive failure.

Graph: 5-RHA Rolling Herd Average, Heifer and Cow ME's

Purpose:

To monitor rolling herd average milk (RHA), as well as mature equivalent 305 day milk (ME305) of first lactation and mature cow groups.

Interpretive Comments:

ME305 values are developed by first projecting the expected total milk production for each cow through a 305-day lactation, and subsequently adjusting the total projected milk to standardize for parity (lactation number), age, season of calving date, and number of times milked per day. ME305 values allow individual cows to be compared fairly, regardless of age and the other factors.

There is more momentum in RHA than ME305, meaning that RHA resists changes in direction more than ME305.

ME305 is independent of herd calving intervals, whereas RHA is not. Long calving intervals will lower RHA and spread the difference between RHA and ME305.

ME305 includes a conversion to 2X milking, so RHA and ME305 tend to be closer in absolute value in herds milked 3 times a day.

In typical herds, first lactation ME305 milk is an average of 300-500 pounds greater than the ME305 of second and greater lactation cows.

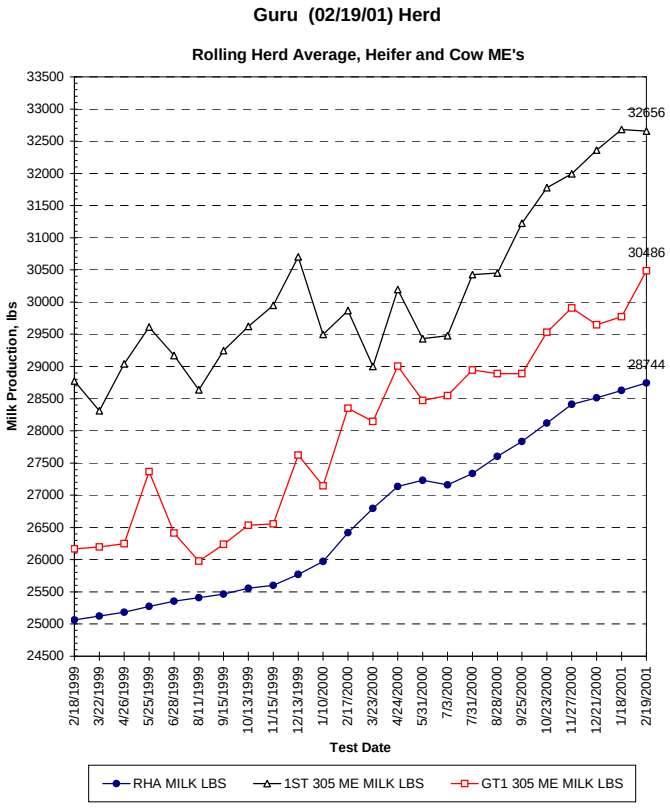
Questions:

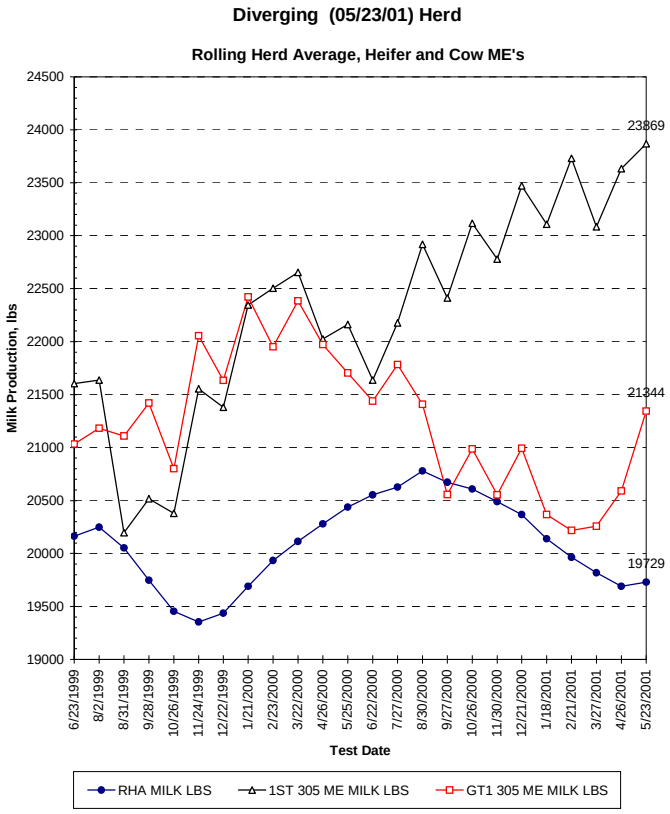
1. Based upon ME305, is herd production going up or down?

2. Relative to ME production, is there a difference between first lactation and mature cow ME's?

3. Does either subgroup appear to be performing differently, better or worse, than the other?

5-RHA Example Herds:





"Guru Dairy" shows a very strong rise in average ME305 values and Rolling Herd Average Milk. The first lactation cows are performing tremendously and slightly better than expected relative to the older cows. The changes in ME305 precede the directional changes in RHA by a month or two.

"Diverging Dairy" shows declining RHA milk starting in September of 2000. The ME305 graph shows that the production problem lies exclusively with the mature cows in the 2nd or greater lactations, and that the first lactation cows are doing wonderfully. An investigation of herd production problems on the dairy would focus almost exclusively on problems with the mature cows.

Graph: 6-TCI Trend Trend of Transition Cow Index

Purpose:

To visualize any trends in how fresh cows are performing over the past year.

Interpretive Comments:

The basis of the Transition Cow Index (TCI™) is explained in the comments for Graph 7.

Each dot represents the TCI™ for each cow in the herd. The Y-scale is limited to ±10,000 lbs and cows with TCI™ scores more extreme than this will not be represented on the graph. Along the X-axis, the days relative to the last test date are indicated. For example, 30 and 60 indicate that the cows above each calved 30 or 60 days before the last test date. In contrast, cows represented by dots near 300 days in milk are cows that calved about 10 months ago. While such cows may be nearly 300 days in milk, the value plotted on the graph for that cow was generated at her first test which occurred about 285 days ago. Below that, the approximate month of the year is shown.

The line plotted down the middle of the graph shows the average TCI™ for all cows that calved in that particular month.

Above the graph, the numbers represent the average TCI™ of the cows that calved within the monthly time period.

The TCI™ of cows that have been culled in the past year remain on the graph until 366 days after their last calving.

If improvements have been implemented in the transition cow program in the past months, the line should be going upward toward the right. Conversely, if the line is going down toward the right, recent fresh cow performance is getting poorer.

Small herds with very few cows calving in a single month will find that the line in the graph is of very little value for interpreting current performance.

Questions:

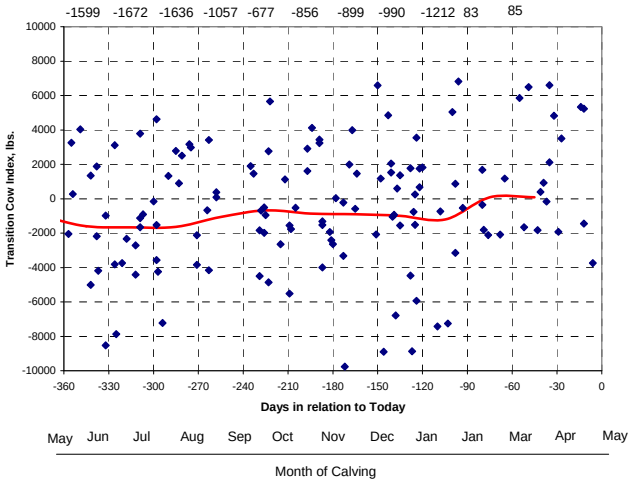
1. What is the minimal number of cows calving per month in this graph? If there are very few cows calving each month, the rolling average line has little value for interpreting trends.

2. Is there any recent change in direction of the line representing average performance by month? If so, is recent fresh cow performance getting better or worse?

6-TCI TREND Example Herds:

Making Strides Dairy (05/01/06) Cow

Trend of Transition Cow Index



Numbers at the top of the chart are 3-month rolling averages for TCI

Herd Average TCI = -942

Proportion of mature cows tested with a TCI™ = 78%

The predominant breed is: Holstein

This herd is milked 2 times per day

This herd is using a medium level of BST for Lactation 1 animals

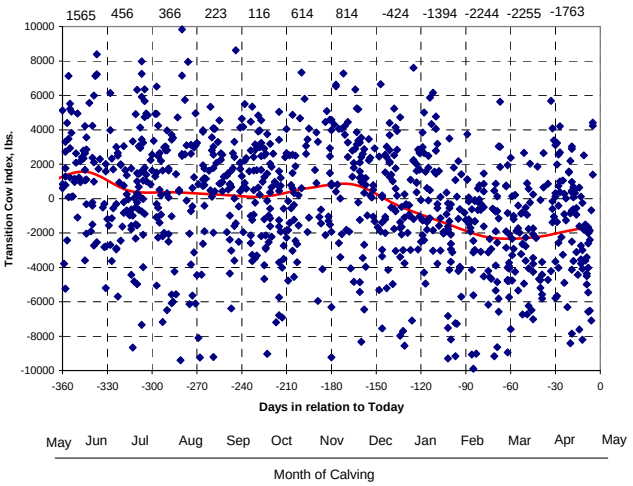
This herd is using a medium level of BST for Lactation 2+ animals

Disclaimer: These calculated values are valid ONLY if BST usage (label, low, medium, or no BST) over the prior year have been accurately described during initial input prompts when the data was loaded into WisGraph.

The trend line of the TCI™ at "Making Strides Dairy" has been steady at approximately -1,000 until January 2006, when the TCI™ average moved quickly to just over zero. The herd owner attributes the improvement to expanded sand freestalls for the fresh cows in their herd.

Slippery Slope Dairy (05/05/06) Cow

Trend of Transition Cow Index



Numbers at the top of the chart are 30 day averages for TCI

Herd Average TCI = -284

Proportion of mature cows tested with a TCI™ = 80%

The predominant breed is: Holstein

This herd is milked 3 times per day

This herd is using label amounts of BST for Lactation 1 animals

This herd is using label amounts of BST for Lactation 2+ animals

Disclaimer: These calculated values are valid ONLY if BST usage (label, low, medium, or no BST) over the prior year have been accurately described during initial input prompts when the data was loaded into WisGraph.

The average TCI™ scores at "Slippery Slope Dairy" were relatively steady just in the positive range until January. Since that time, the TCI™ has dropped into the minus 2,000 lb. range. The drop is coincident with a major herd expansion and barn reconstruction project that has created overstocked special needs pens and altered pen flows as the building is modified.

Graph: 7-MEDIM Current ME305 vs. Days in Milk

Purpose:

To monitor peak milk of mature cows and obtain more current information than is available from the standard reported herd average ME305.

Interpretive Comments:

Each dot represents a single cow and is positioned over her days in milk on the current test and at the ME305 milk that she has achieved at her current stage of lactation. The month abbreviations below the x-axis suggest the approximate time of year that the cow calved.

ME305 milk standardizes individual animal production for age, lactation, 2x milking, and season. ME305 will respond to production changes that occur until 305 days in milk, after which it is fixed. ME305 is more sensitive to change in early lactation than late lactation. The ME305 of a cow who is more persistent than average will increase as the cow progresses through the lactation, while the ME305 of a cow who is less persistent than average will fall slightly as the lactation progresses.

Low production cows tend to be culled earlier in lactation than high producers, resulting in a selected group of higher producers on the right side of the graph.

The regression line and formula can give an indication of change between early and late lactation. The slope A ($y = \mathbf{A}x$ + constant) indicates how much ME305 changes for each increasing day in milk. From a moderate number of farms, the typical value of A ranges from about 5-15. In general, values approaching 20 or more are found in herds with relatively disappointing early lactation performance and good late lactation production.

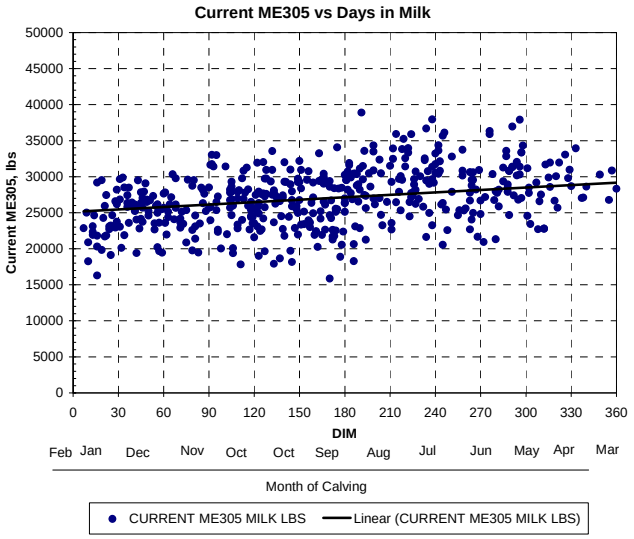
Questions:

1. Should we expect to see a seasonal effect on the ME305 values of cows that calve in July?

2. How would you expect the use of BST in the herd affect this graph?

7-MEDIM Example Herds:

Steady (02/28/01) Cow



Average ME305 = 27196
Standard Deviation = 3957
Coefficient of Variation = 14.6%

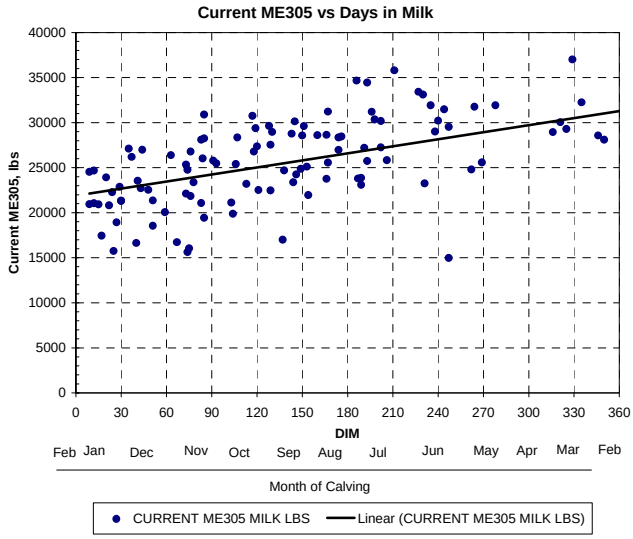
y = 11.263x + 25110
R^2 = 0.1431

DIM	Average ME305 # cows	Ave
1-100	128	25084
101-200	193	26526
201-305	132	29203

Selection Criteria:
Dim>=1, Test Day Milk>=1

To view cows over 360 days in milk adjust the x-axis scale

Ketone (02/07/01) Cow



Average ME305 = 25865
Standard Deviation = 4740
Coefficient of Variation = 18.3%

y = 26.055x + 21905
R^2 = 0.3415

DIM	Average ME305 # cows	Ave
1-100	42	22537
101-200	42	26613
201-305	17	28826

Selection Criteria:
Dim>=1, Test Day Milk>=1

To view cows over 360 days in milk adjust the x-axis scale

"Steady Dairy" shows a herd with stable, consistent performance of cows over the past year. The average ME305 goes up 11.26 lbs per day of lactation and the difference between the early and late groups is about 4,000 lbs. Culling has removed lower producers that are greater than 200 days in milk.

"Ketone Dairy" has a long-term problem of fresh cow health problems of ketosis and hepatic lipidosis in many cows, but most cows produce milk quite well after they have gotten through the early lactation period. BST is also used in the herd. The ME305 increases 26 lbs. per day of lactation and the difference between the early and late group is about 6,000 lbs.

Graph: 8-Milk Milk Production (Lbs/Cow/Day)

Purpose:

To monitor daily milk production per cow over time.

Interpretive Comments:

Milk per cow reflects productivity, but is confounded by days in milk and other factors such as age and parity of the herd.

Management level milk adjusts actual milk to standard 150 days in milk, constant fat %, protein %, and parity.

Questions:

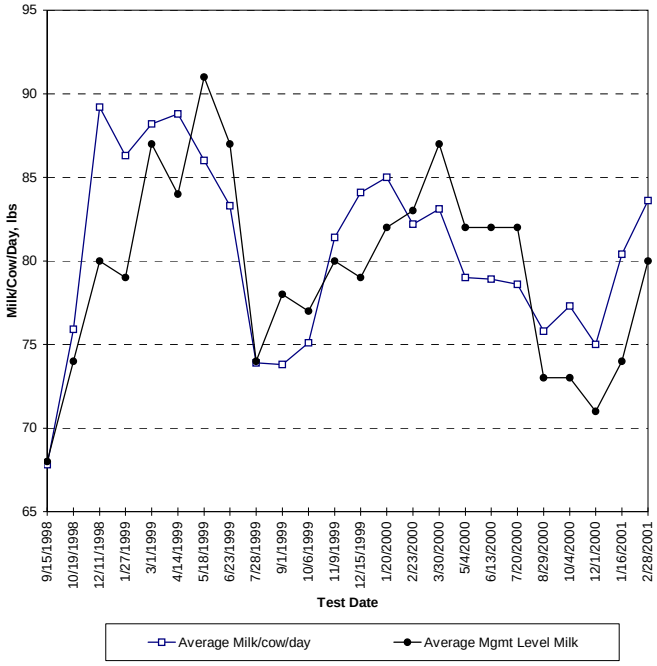
1. Is the herd doing better at the current test than the previous test? Which monitor is best to make comparisons over time?

2. Is the herd doing better at the current test than a year ago?

8-Milk Example Herds:

Steady (02/28/01) Herd

Milk Production (Lbs/Cow/Day)

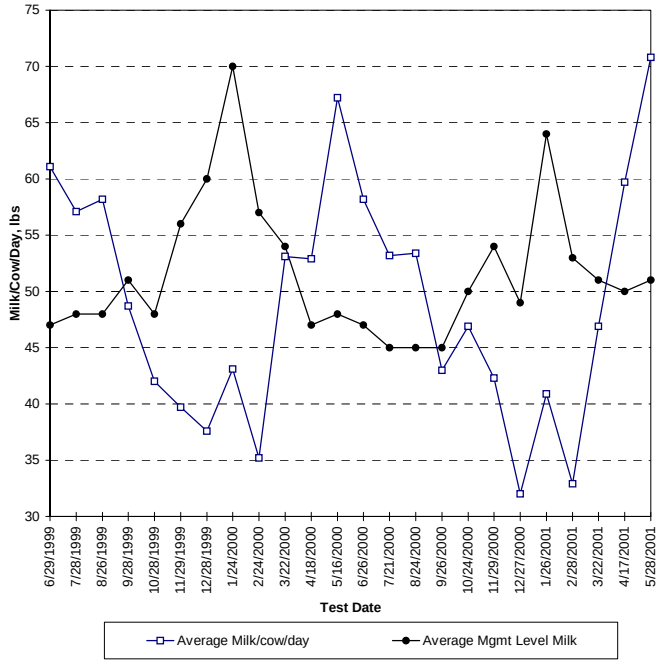


12 Month Average Milk/Cow/Day = 79

12 Month Average Mgmt Level Milk = 78

Grazier (05/28/01) Herd

Milk Production (Lbs/Cow/Day)



12 Month Average Milk/Cow/Day = 48

12 Month Average Mgmt Level Milk = 50

"Steady Dairy" shows an increase in actual milk and MLM since the last test, and while actual milk is slightly increased from one year ago, MLM is down. Both indexes indicate a decline from the period in the spring of 1999.

Actual milk at "Grazier Dairy" shows the variation possible due to extreme ranges of days in milk. In the period from March through December, the average herd production looks like a lactation curve. Conversely, the MLM index remains relatively flat. The MLM index suggests that the cows are doing better than expected in December or January.

Graph: 9-Tank Bulk Tank Milk and DHI Milk

Purpose:

To monitor total milk sales from dairy and reconcile DHI and milk plant weights.

Interpretive Comments:

Bulk tank milk is reported by the milk truck driver who records the amount before emptying the tank and hauling it away.

DHI milk pounds are expected to be equal or up to 3% higher than bulk tank weight. DHI measures milk from all cows, but some of that milk is discarded because of antibiotics, fed to calves, or used for other purposes. Therefore, bulk tank milk is expected to be slightly less than DHI.

DHI milk meters can malfunction resulting in variation.

Bulk tanks can shift resulting in errors in dipstick calibration.

Bulk tank pickup may not be synchronized with the completion of milking, resulting in variance.

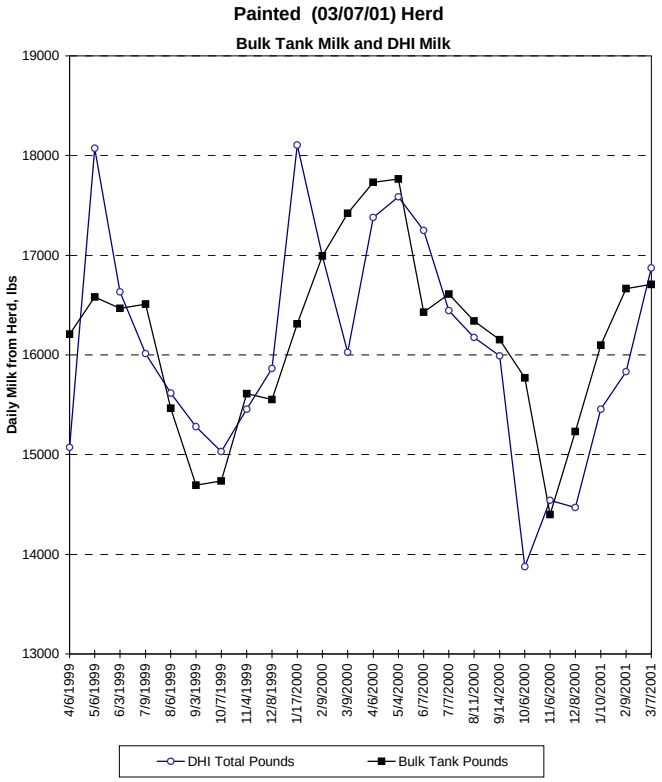
Unequal milking intervals paired with am/p.m. testing can produce variance

Questions:

1. Review the absolute pounds over the past year. Estimate the high and low gross milk income per day in the last year.

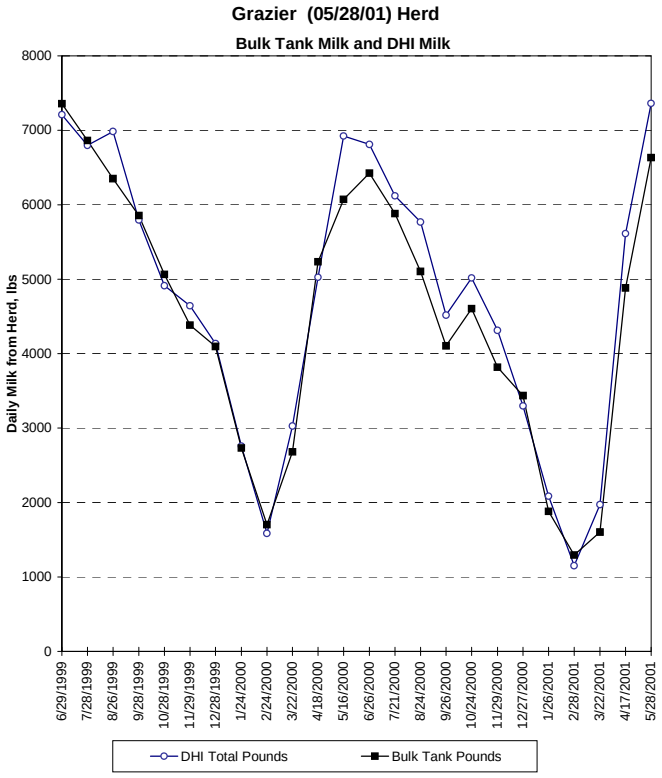
2. Is there a difference between bulk tank and DHI milk? What would be some reasons for a difference in this herd?

9-Tank Example Herds:



Current Month Percent Shipped = 99

12 Month Average Percent Shipped = 103



Current Month Percent Shipped = 90

12 Month Average Percent Shipped = 93

"Painted Dairy" has sold more milk over the past year than DHI testing has measured. This usually reflects a problem with either the meters used for testing, or it may reflect a milking system inadequacy when the meters are introduced for testing.

"Grazier Dairy" shows less milk sold than found on DHI testing. This may reflect milk used for calves, milk withheld because of antibiotic withdrawal, or other uses. The disparity between bulk tank an DHI weights is greatest when the herd is milking the most and when calves would be consuming milk. In this seasonally calving herd, there is tremendous difference in milk income per month between the high and low production months.

Graph: 10-Peak-c Current Peak Milk vs. Days in Milk

Purpose:

To monitor peak milk and obtain more current information than is available from the standard reported average peak milk.

Interpretive Comments:

Peaks of 2nd and greater lactation cows are shown as solid circles, while peaks of first lactation cows are shown as open triangles.

A single dot represents a single cow and is positioned over her days in milk at the current test and at the level of the peak milk that she achieved at some undescribed point in her lactation. In general, the peak milk value is established by 60 days in milk, but the cow carries that value with her to the end of her lactation.

The month abbreviations below the x-axis suggest the approximate time of year that the cow calved.

Cows that calve in June through September are expected to peak at lower levels than if they had calved during cooler months of the year.

Because low producers tend to be culled earlier in lactation than high producers, culling practices remove low producing cows disproportionately from the lower right portion of the graph.

Questions:

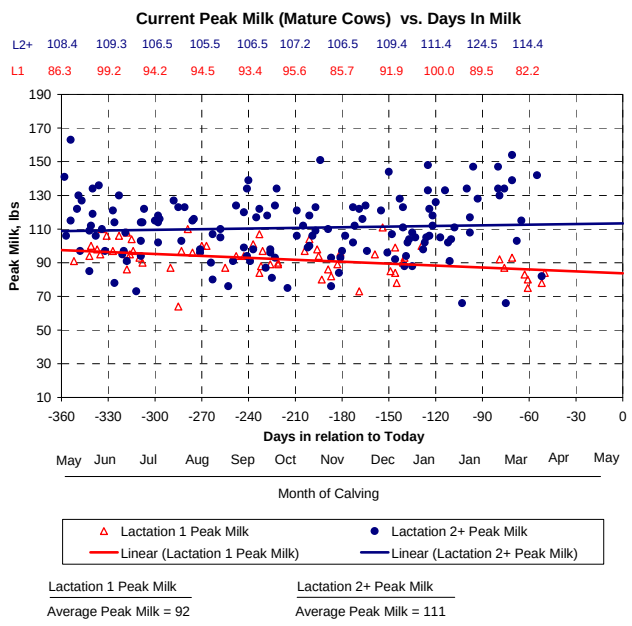
1. Does season of year appear to affect peak milk in this herd?

1. How do the most recently fresh cows appear to be performing relative to herdmates who calved in past months?

2. How does the culling of low producers at mid-lactation affect the appearance of this graph?

10-Peak-c Example Herds:

Hillside Dairy (050106) Cow



Lactation 1 Peak Milk
Average Peak Milk = 92

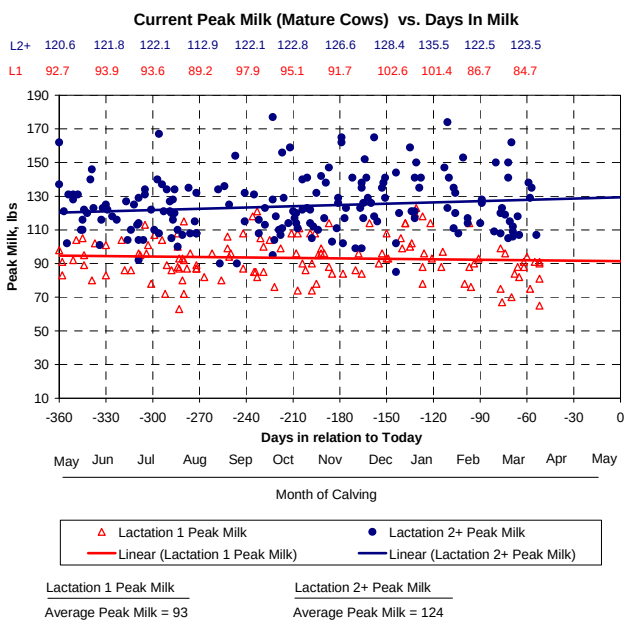
Lactation 2+ Peak Milk
Average Peak Milk = 111

Numbers at the top of the chart are monthly average peak milks by lactation group

Selection Criteria:
DIM>50, DIM<365

"Hillside Dairy" peaks appear to be fairly steady over the past year. However, the peaks of the first lactation cows have slightly decreased over time, while the peaks of the later lactation group and recently increased.

Stepping Stones Dairy (05/16/06) Cow



Lactation 1 Peak Milk
Average Peak Milk = 93

Lactation 2+ Peak Milk
Average Peak Milk = 124

Numbers at the top of the chart are monthly average peak milks by lactation group

Selection Criteria:
DIM>50, DIM<365

"Stepping Stones Dairy" shows peak milk is very steady for their 1st lactation cows. A very slight increase for mature cows is also evident.

Graph: 11-1stFPR Ratio of 1st Test Fat % to 1st Test Protein %

Purpose:

To monitor milk components at the first DHIA test date over time.

Interpretive Comments:

Fresh cows with ketosis tend to have high milk fat %. If a fresh cow has 6% fat and 3% protein, that cow has a 1st test fat : protein ratio (FPR) of 2.0. There is research evidence that herds with high rates of ketosis, either clinical or subclinical, also have a high proportion of cows with a 1st Test FPR greater than 1.4. Our current guidelines suggest that if more than 40% of fresh cows exceed the 1.4 cut-point, the herd is at risk of ketosis. Usually, this will be reflected in higher than average rates of clinical ketosis, displaced abomasums, and fatty liver disease.

In this graph, each data point represents the 1st Test FPR for one cow. The open triangles represent first lactation cows, while the solid squares represent mature cows. Although a cow may be 300 days in milk, the value plotted represents her 1st Test FPR that was collected about 9 months ago. This allows you to track fresh cow ketosis risk in the herd over the past year. The typical risk factors for problem herds are unusual rations for close-up and fresh cows, overstocking of transition cow pens, and an unusual number of pen moves near the time of calving.

Questions:

1. Is the proportion of cows with 1st Test FPR in this herd greater than 40%? If so, are there other herd indicators that support the likelihood of fresh cow ketosis problems?

2. Is the proportion of high ratios different between the first lactation and mature cows? If so, is either group exposed to different management practices than the other?

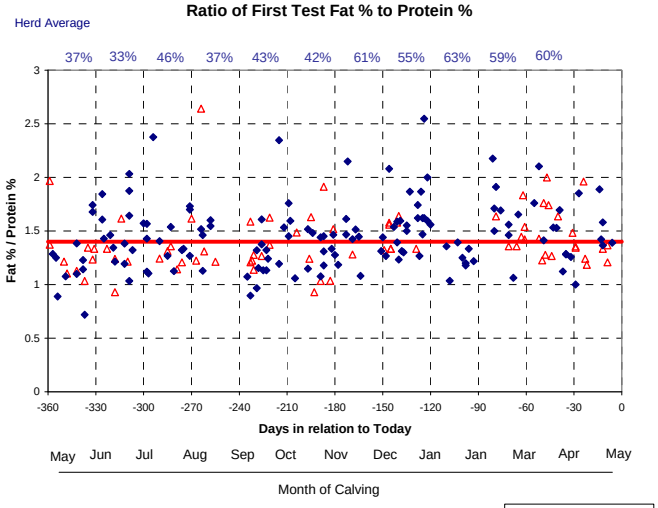
3. Are there any suggestions that the rate of high ratios in increasing or decreasing in recent months?

4. If so, is there a history of a change in management practices that might explain the change?

11-1stFPR Example Herds:

Hillside Dairy (050106) Cow

Ratio of First Test Fat % to Protein %



Percentages at the top of the chart equal the 3-month rolling average percent of cows with a 1st test FPR >1.4

Annual Summary

Percent of animals greater than 1.4 = 50.4%

Percent of 1st lactation animals greater than 1.4 =40.7%

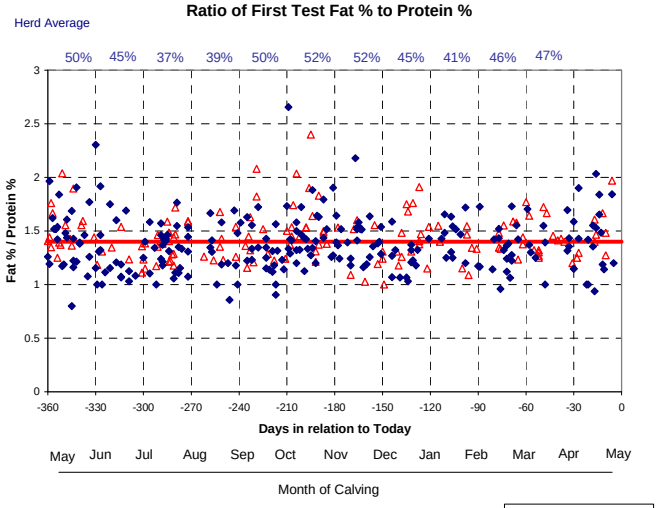
Percent of 2+ lactation animals greater than 1.4 =54.5%

Interpretive comment: > 40% above 1.4 fat to protein ratio is suggestive of a herd subclinical ketosis problem

"Hillside Dairy" appears to have several cows with first test FPR greater than 1.4. With 54.5% of the mature cows above the 1.4 cutpoint, we might expect some problems with ketosis, fatty liver, or displaced abomasums in this herd.

Stepping Stones Dairy (05/16/06) Cow

Ratio of First Test Fat % to Protein %



Percentages at the top of the chart equal the 3-month rolling average percent of cows with a 1st test FPR >1.4

Annual Summary

Percent of animals greater than 1.4 = 48.9%

Percent of 1st lactation animals greater than 1.4 =56.3%

Percent of 2+ lactation animals greater than 1.4 =45%

Interpretive comment: > 40% above 1.4 fat to protein ratio is suggestive of a herd subclinical ketosis problem

With 56.3% of 1st lactation cows showing a 1st Test FPR greater than 1.4, "Stepping Stone Dairy" is likely to have many fresh cow problems with ketosis and displaced abomasums. The mature cows are not as high.

Graph: 12-%Fat Milk Fat and Protein Tests

Purpose:

To monitor milk fat % and protein % over time.

Interpretive Comments:

Fat % and protein % vary with breed. 1998 Wisconsin DHI shows the following breed average milk components:

Breed	Ayrshire	Brown Swiss	Guernsey	Holstein	Jersey	Milking Shorthorn
Fat %	3.9	4.1	4.5	3.8	4.7	4.0
Protein %	3.2	3.4	3.4	3.1	3.6	3.2

Fat % that is .3% higher than breed average suggests that the rations may be short on energy and that the herd would respond with increased milk if corrected.

Fat % that is .3% lower than breed average suggests that the herd may be short on fiber and may be experiencing rumen acidosis.

There are lactation fat % and protein % curves that are almost mirror images of the milk curve. If the herd is seasonal, expect wide variation in component % as the herd changes from short days in milk to long days in milk.

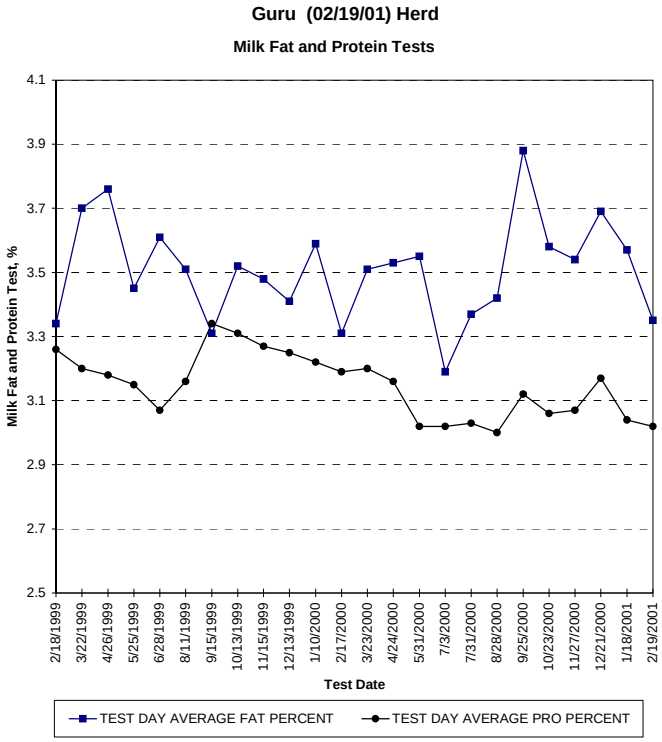
Questions:

1. Are there any months where fat % is abnormally low or high?

2. Are these seasonal problems or not?

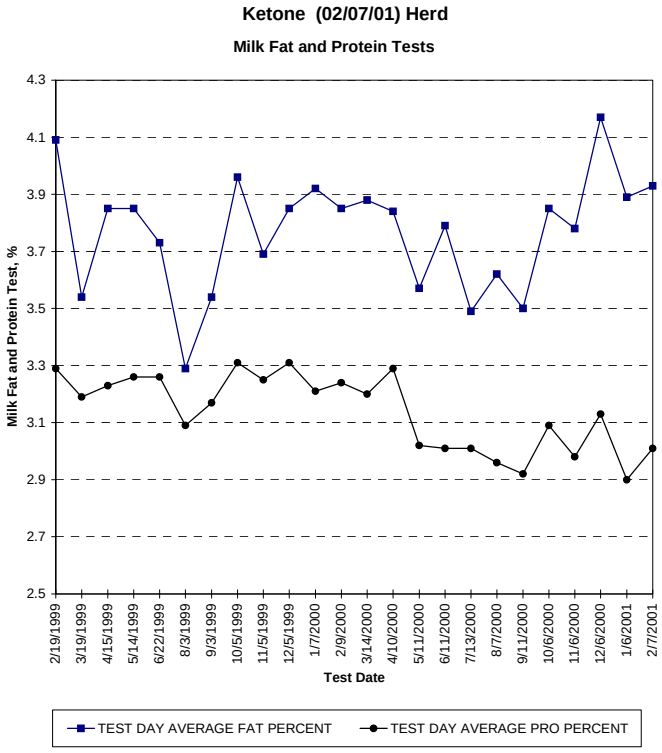
3. Are there any months where protein % is too low or too high?

12-%Fat Example Herds:



12 Month Average Percent Fat = 3.5

12 Month Average Percent Protein = 3.1



12 Month Average Percent Fat = 3.8

12 Month Average Percent Protein = 3.1

"Guru Dairy" shows large fluctuations in fat % over the past 8 months, ranging from 3.2% to 3.9%. While the 3.2% test in July 2000 is alarming, the most recent test at 3.35% in February is even more alarming because of the season.

The protein % shows the expected drop in May 2000 when testing methods changed.

"Ketone Dairy" shows an unusually high milk fat % for Holsteins, particularly over the past 3 months. The high fat % is suggestive of rations that are moderately low in energy. Usually ration manipulations to reduce fiber and increase energy in this situation will increase milk and reduce fat% to more typical ranges.

Graph: 13-DIM%Fat DIM and Current Test Day Percent Fat

Purpose:

To display the individual cow fat % values by stage of lactation.

Interpretive Comments:

The fat % curve is almost opposite a lactation curve. Milk fat % is expected to be high in early lactation, decline to a low near 60 days in milk, and then gradually increase as the lactation progresses. The variation above and below is expected to be about 10% of the lactation average fat %.

Abnormal low fat percentage is suggestive of dietary fiber deficiency or dietary fat excess. For Holsteins we use a cut-point below 2.5% fat. If more than 10% of the herd has a fat percent below 2.5, it suggests that the herd may be experiencing subacute ruminal acidosis.

Abnormal high fat percentage is suggestive of excess dietary fiber, inadequate ration energy, and sometimes ketosis. If more than 10% of Holstein cows less than 60 days in milk are above 5% fat, we suspect that fresh cows are at high risk of ketosis, fatty liver, and other fresh cow problems.

Questions:

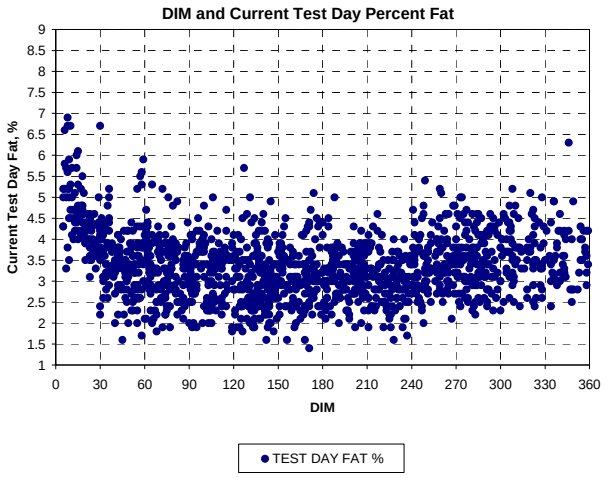
1. Does the herd scatterplot resemble the expected fat % curve?

2. Estimate the overall average fat %.

3. Are there any cows that are either alarmingly low or high?

13-DIM%F Example Herds:

Wild West (02/04/05) Cow



Average Percent Fat = 3.4

Standard Deviation = 0.78

Coefficient of Variation = 4.4%

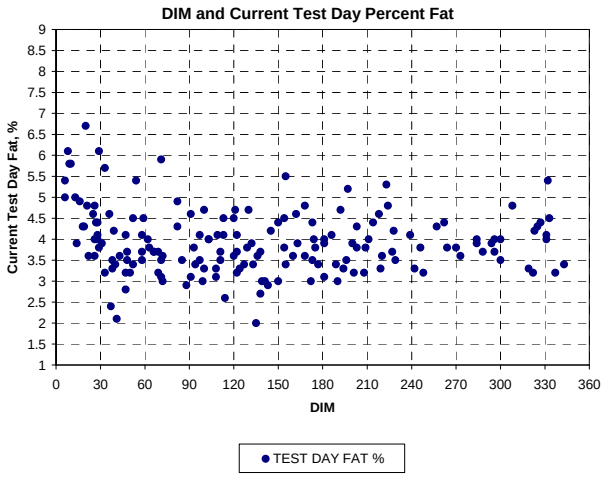
Cows >= 5.0% Fat and < 60 DIM= 35 of 263 (13%)

Cows < 2.5% Fat = 168 of 1639 (10%)

Selection Criteria:
Dim>=1, Test Day Milk>=1

To view cows over 360 days in milk adjust the x-axis scale

DA Dairy (01/25/05) Cow



Average Percent Fat = 3.9

Standard Deviation = 0.76

Coefficient of Variation = 5.1%

Cows >= 5.0% Fat and < 60 DIM= 10 of 47 (21%)

Cows < 2.5% Fat = 4 of 189 (2%)

Selection Criteria:
Dim>=1, Test Day Milk>=1

To view cows over 360 days in milk adjust the x-axis scale

The overall average % fat at "Wild West Dairy" is 3.4%, there are many cows with abnormal fat %, both high and low, spread across all stages of lactation. The herd percentages of unusual fat % exceed our guidelines on both high fat % in the fresh cows, as well as low tests across lactation. If there are metabolic health problems in this herd, diagnostic testing for both ketosis and ruminal acidosis should be performed.

At "DA Dairy", 21% of the cows less than 60 days in milk showed milk fat % greater than 5%. This is very suggestive of a fresh cow ketosis problem. Testing for ketones should be performed on both close-up dry cows and fresh cows to identify if either group is affected.

Graph: 14-Age Age at First Calving Distribution

Purpose:

To evaluate the distribution of calving ages of first lactation cows in the herd.

Interpretive Comments:

The average age at first calving for all Wisconsin DHI herds is 27 months, while the standard industry goal is 24 months.

Very successful replacement rearing programs are capable of calving 80% of their replacements in a 2 month window.

A wide distribution of calving age can suggest inconsistent heifer growth rates, reproductive problems in the replacement herd, or inconsistent replacement management goals.

A small number of very old animals will have a greater effect on the average age than on the median age at calving.

Questions:

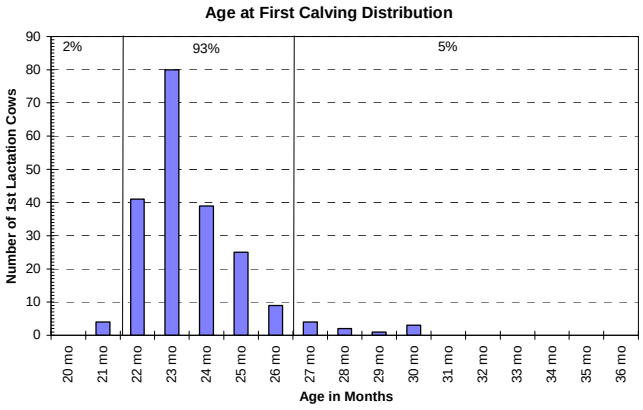
1. What is the average and median age at first calving?

2. Is the distribution pattern desirable?

3. What does the distribution histogram of calving age tell you about the replacement program?

14-Age Example Herds:

Steady (02/28/01) Cow



Average Calving Age in Months = 24

Median Calving Age in Months = 23

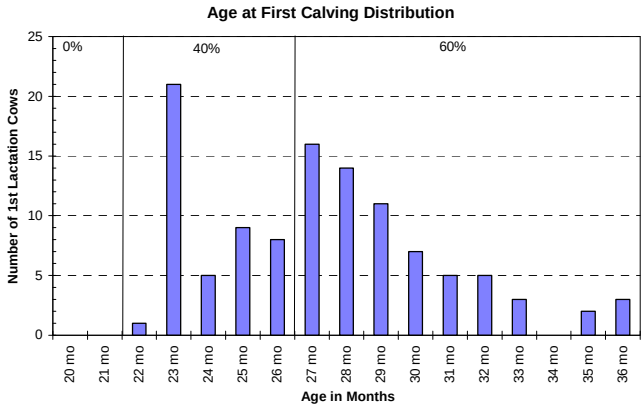
Target = 24

% < 22 months = 2

% > 26 months = 5

Selection Criteria:
Lactation=1

Relaxed (03/12/01) Cow



Average Calving Age in Months = 27

Median Calving Age in Months = 27

Target = 24

% < 22 months = 0

% > 26 months = 60

Selection Criteria:
Lactation=1

"Steady Dairy" achieves 93% of heifers calving between 22 and 27 months of age. The rather tight distribution of ages reflects excellent breeding, and probably feeding, management of the heifers.

While the average heifer on "Relaxed Dairy" has a calf at 27 months, age is extremely varied with animals calving at a similar frequency from 22 to 36 months of age. There would be substantial economic benefits to this dairy in improving the management of the replacement herd.

Graph: 15-DIM Days in Milk

Purpose:

To monitor herd average days in milk.

Interpretive Comments:

Herd average DIM can be very stable if similar numbers of cows freshen and are dried off each month.

The 12 month rolling average DIM is quite dependent upon herd reproductive performance.

Industry goal for rolling average DIM is about 170 days for conventional dairies, and about 160 for grazing dairies where synchronization with the spring flush of grass is critical. A goal of 170 DIM would yield an average lactation length of twice that for 340 days. If a 55 day dry period is added, this yields an approximate 395 day (13 mo) calving interval.

Cows milk less with increasing DIM, and are expected to decline .12 to .17 pounds per cow per day for each day over 160.

Questions:

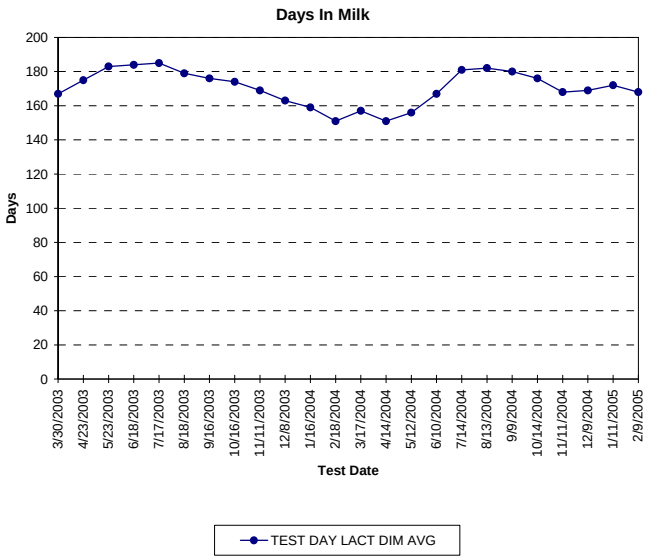
1. What is the rolling average DIM?

2. What factors cause the average day-in-milk to go down?

3. Do you view the 12-month rolling average days in milk for this herd as a problem?

15-DIM Example Herds:

Hilltopper (02/09/05) Herd



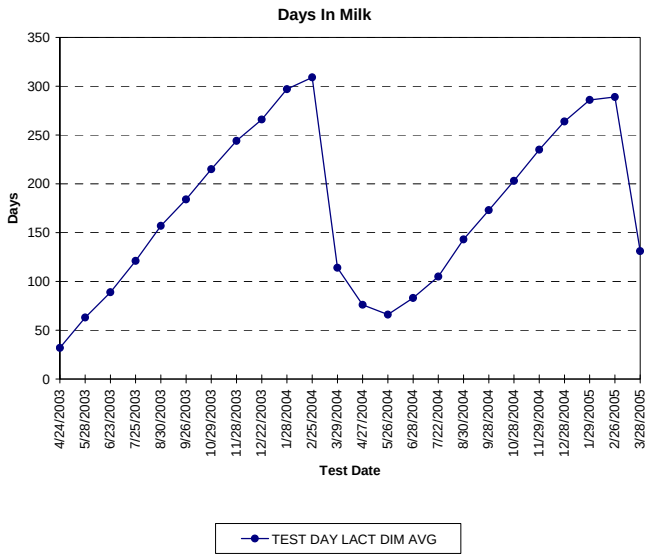
Weighted Average DIM* (last 12 months) = 168

Target Average Days in milk = 160

* The weighted average DIM value is valid only if the herd tests at regular intervals

Average DIM at "Hilltopper Dairy" varies slightly through the year, ranging from 156 to 182 days. This reflects superb reproductive management and has become increasingly difficult to achieve with higher and higher production levels.

Grazier (03/28/05) Herd



Weighted Average DIM* (last 12 months) = 163

Target Average Days in milk = 160

* The weighted average DIM value is valid only if the herd tests at regular intervals

"Grazier Dairy" is a seasonal calving dairy that shows a similar repeating pattern each year. With a rolling average DIM of 182, the herd has ranged from 70 to 310 days in milk in the past year.

Graph: 16-Dry Days Dry Distribution

Purpose:

To monitor distribution of dry day periods over time.

Interpretive Comments:

The average days dry for Wisconsin dairy herds is 64 days.

Industry goal is 55 to 60 days dry.

The average Wisconsin herd has about 13% of cows <40 days dry and about 26%> than 70 days dry.

Recently, many herds have switched to a shortened dry period of 30 to 45 days. You may see this as an abrupt or gradual step up in the shaded area at the bottom of the graphs.

Dry periods greater than 70 days result in feed wasted in maintaining unproductive dry cows and in reduced milk sales from the farm. Losses are estimated in the range of $3.00 per dry day over 70 days.

Questions:

1. Is the distribution of dry periods normal?

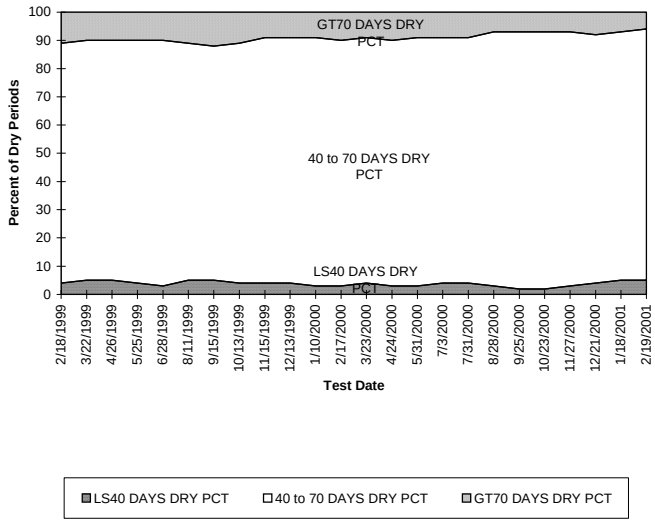
2. Is there a trend and is it desirable or undesirable?

3. What management factors can create long dry periods?

16-Dry Example Herds:

Guru (02/19/01) Herd

Days Dry Distribution



Average Days Dry (Current Test) = 58

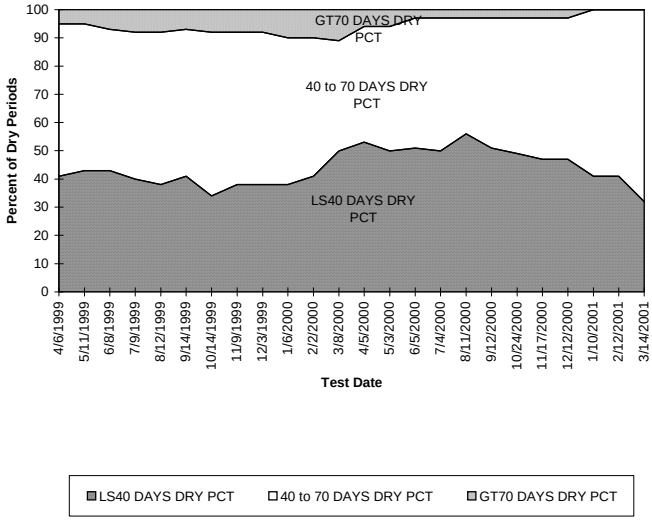
Average Days Dry (last 12 months) = 59

Target Days Dry = 56

"Guru Dairy" is doing an exemplary job of minimizing short dry periods, and average with long dry periods.

Calendar (03/14/01) Herd

Days Dry Distribution



Average Days Dry (Current Test) = 42

Average Days Dry (last 12 months) = 40

Target Days Dry = 56

"Calendar Dairy" is making good progress since December 2000 in correcting a substantial problem with short dry periods. In contrast, the herd has always shown good control of long dry periods.

Graph: 17-D1B Days in Milk at First Breeding, All cows bred

Purpose:

To evaluate the distribution of days to first breeding in a herd.

Interpretive Comments:

The industry goal for average days to first breeding is usually about 75 days, but the average DHI Holstein herd in Wisconsin now averages 97 days.

The primary factors in determining average days to first breeding are the voluntary waiting period and heat detection efficiency.

Questions:

1. Would you expect a normal bell-shaped distribution for this index? Why?

2. What is this herd's average DIM at 1st breeding? What do you consider to be a reasonable goal?

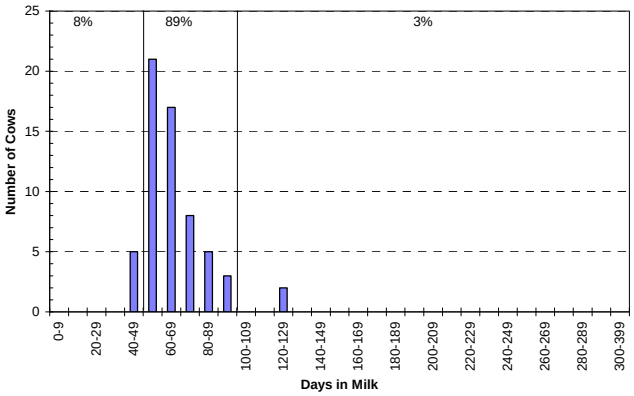
3. Which do you think best describes the central tendency: average or median?

4. Make an estimate of the voluntary waiting period in this herd?

17-D1B Example Herds:

Master (02/28/01) Cow

Days in Milk at First Breeding*, All Cows Bred



Average Days to 1st Breeding = 66

Median Days to 1st Breeding = 63

Percent of Animals 0 to 49 DIM at 1st Breeding = 8%

Percent of Animals 50 to 99 DIM at 1st Breeding = 89%

Percent of Animals >100 DIM at 1st Breeding = 3%

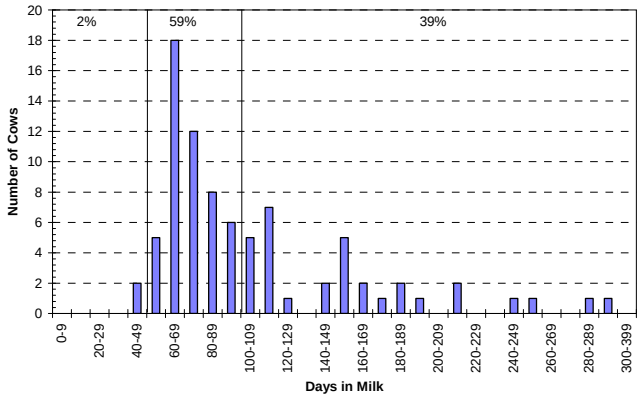
Selection Criteria:
Dim>=1

* All breedings must be reported in order for this chart to be valid

"Master Dairy" has average days to first breeding of 66 days, yet achieves an average days open of 108 days. An OvSynch program is used aggressively to achieve an extremely impressive profile of days to first breeding.

Hilltopper (02/09/05) Cow

Days in Milk at First Breeding*, All Cows Bred



Average Days to 1st Breeding = 106

Median Days to 1st Breeding = 86

Percent of Animals 0 to 49 DIM at 1st Breeding = 2%

Percent of Animals 50 to 99 DIM at 1st Breeding = 59%

Percent of Animals >100 DIM at 1st Breeding = 39%

Selection Criteria:
Dim>=1

* All breedings must be reported in order for this chart to be valid

"Hilltopper Dairy" practices a conventional heat detection program, achieving a median days to first breeding of 86 days.

Graph: 18-ADO Days Open, Pregnant Cows

Purpose:

To visualize the distribution of days open in the herd.

Interpretive Comments:

An average days open of 100 days is required to maintain a 12.5 month calving interval, but the average DHI Holstein herd in Wisconsin currently realizes 130 days open. Benchmarks of excellent, average, and poor reproductive performance are listed below.

Percent of Cows Pregnant in Each Range			
Herd Performance	Less than 100 DIM	100-159 DIM	More than 160 DIM
Best, <110 ADO	50	32	18
Average, 130 ADO	40	32	28
Poorest, >160 ADO	30	32	38

Questions:

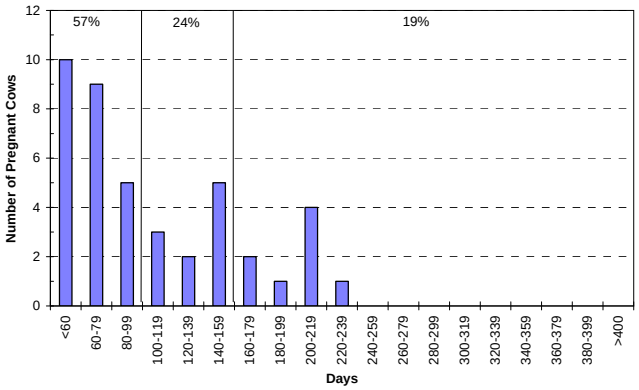
1. What is the average days open in the herd?

2. Does the distribution suggest inefficiency or other problems?

18-ADO Example Herds:

Master (02/28/01) Cow

Days Open, Pregnant Cows



Herd Average Days Open = 108

Herd Median Days Open = 91

Target Days Open = 110

Percent of Animals 0 to 99 Days Open = 57%

Percent of Animals 100 to 159 Days Open = 24%

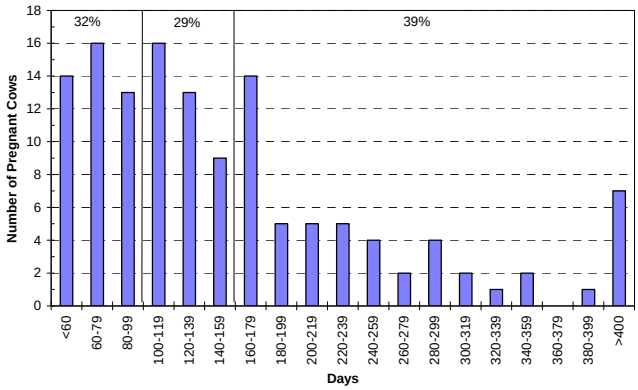
Percent of Animals > 160 Days Open = 19%

Selection Criteria:
Diagnosed Preg=Yes

"Master Dairy" achieves an impressively short average days open with a very small proportion of cows exceeding 200 days.

Sun Shade (03/12/01) Cow

Days Open, Pregnant Cows



Herd Average Days Open = 162

Herd Median Days Open = 130

Target Days Open = 110

Percent of Animals 0 to 99 Days Open = 32%

Percent of Animals 100 to 159 Days Open = 29%

Percent of Animals > 160 Days Open = 39%

Selection Criteria:
Diagnosed Preg=Yes

"Sun Shade Dairy" experiences a long average days open, and is characterized by highly variable days open. The herd distribution is spread almost evenly from 80 to 280 days in milk.

Graph: 19-S-C Reported Services per Pregnancy, Pregnant Cows

Purpose:

To summarize services per conception in the herd.

Interpretive Comments:

The accuracy of this report is dependent on the completeness of the breeding information supplied by the dairy manager.

A reasonable target for average services per conception, pregnant cows, in higher producing herds is about 2.2.

Some record systems report average services per conception, all cows, which includes units of semen used on cows that did not become pregnant. That index should not be confused with the index reported by DHI in this report.

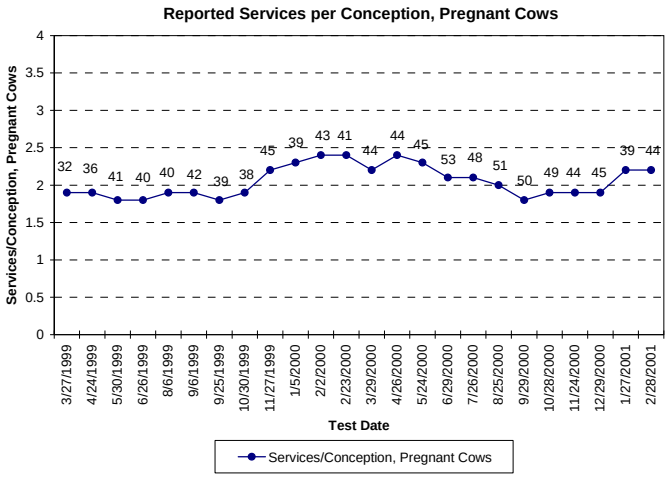
Questions:

1. Is herd services per conception better or worse than average?

2. Is there a change in services per conception over the past year?

19-S-C Example Herds:

Master (02/28/01) Herd



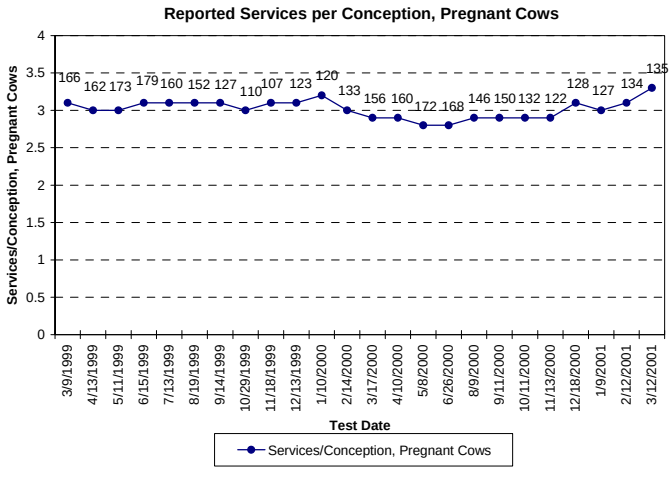
	Your Herd	Target
Average Services per Conception, pregnant cows = 2.1		2.2
Average Services per Conception, all cows = 2.1		2.5
12 Month Average		
Average Services per Conception, pregnant cows = 2.1		2.2

All breedings must be reported in order for this chart to be valid.

Cows with a breeding date and no subsequent information are assumed pregnant after 90 days in DHI calculations.

"Master Dairy" experiences approximately average conception rates, and was achieveing better rates last fall when compared to a year ago last fall.

Sun Shade (03/12/01) Herd



	Your Herd	Target
Average Services per Conception, pregnant cows = 3.2		2.2
Average Services per Conception, all cows = 3.1		2.5
12 Month Average		
Average Services per Conception, pregnant cows = 2.9		2.2

All breedings must be reported in order for this chart to be valid.

Cows with a breeding date and no subsequent information are assumed pregnant after 90 days in DHI calculations.

"Sun Shade Dairy" has higher services per conception rate than average. This factor, combined with less effective heat detection, creates the long average days open seen on the dairy. Reviews of semen quality, semen handling, and insemination techniques should be performed

Graph: 20-S-C-All Reported Services per Pregnancy, Pregnant Cows

Purpose:

To examine how persistently AI is attempted on difficult breeders.

Interpretive Comments:

The accuracy of this report is dependent on the completeness of the breeding information supplied by the dairy manager.

Average services per conception, pregnant cows, in higher producing herds is about 2.0.

Questions:

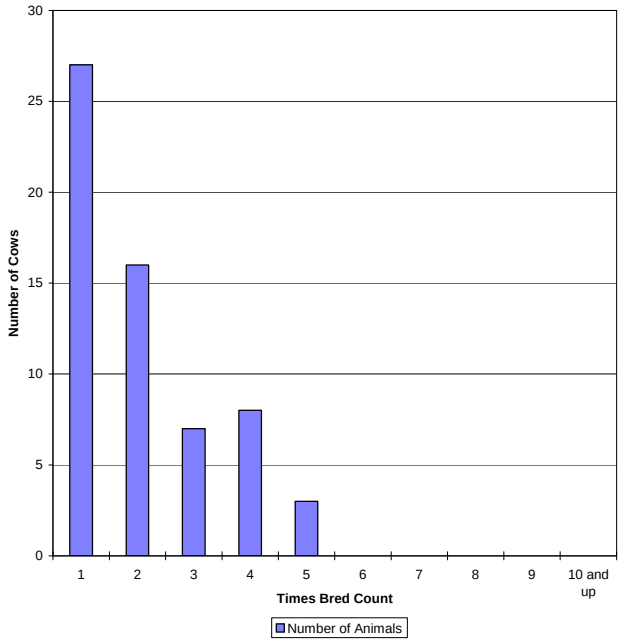
1. What is the maximal number of services used on a cow?

2. Is there more than one cow in that category? If so, how many?

20-S-C-All Example Herds:

Master (02/28/01) Herd

Reported Services per Pregnancy, All Cows



Average Services per Conception, all cows = 2.1

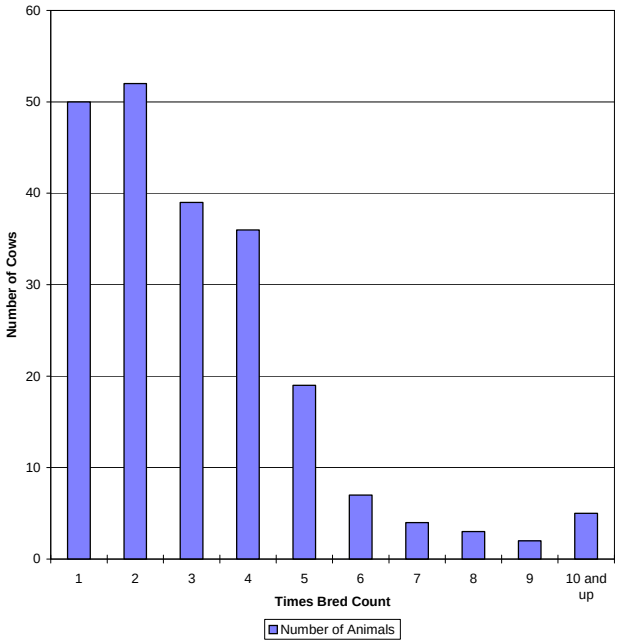
% Bred 4 or more times = 18

Selection Criteria:
Times Bred>=1

"Master Dairy" records show a maximum of 5 services per cow.

Sun Shade (03/12/01) Herd

Reported Services per Pregnancy, All Cows



Average Services per Conception, all cows = 3.1

% Bred 4 or more times = 35

Selection Criteria:
Times Bred>=1

"Sun Shade Dairy" shows that a number of cows were bred 6 or more times, with 5 cows bred 10 or more times.

Graph: 21-NM$-h Net Merit Trends

Purpose:

To monitor current semen selection practices with service sires, and track relative genetic merit of parity groups over time.

Interpretive Comments:

Net Merit $ is an index that estimates the dollar value of the milk production, SCC, and longevity of daughters of AI bulls. Every 5 years, the NM$ values are reset to a new base, so major drops of all categories occur when the base adjustments occur. The next adjustment to base will occur in 2005. While the absolute values are not important, the difference between bulls is important.

Because of continuing genetic progress, the NM$ of the bulls used most recently should be the highest. Service sires are current and should be highest. Sires of first lactation cows represent semen used approximately 3 years previously, so should be of lower NM$ value. Sires of mature cows represents bulls used approximately 5 years ago, so they should be the lowest NM$ value.

Because of continuing genetic progress, each line should increase gradually from left to right as newer, higher genetic potential animals enter the herd or move from one of the subgroups into the next. A single animal can contribute her sire's data to the first lactation line on the left side of the graph, but then contribute to the second and greater lactation line if she enters her second lactation at a date covered by the graph.

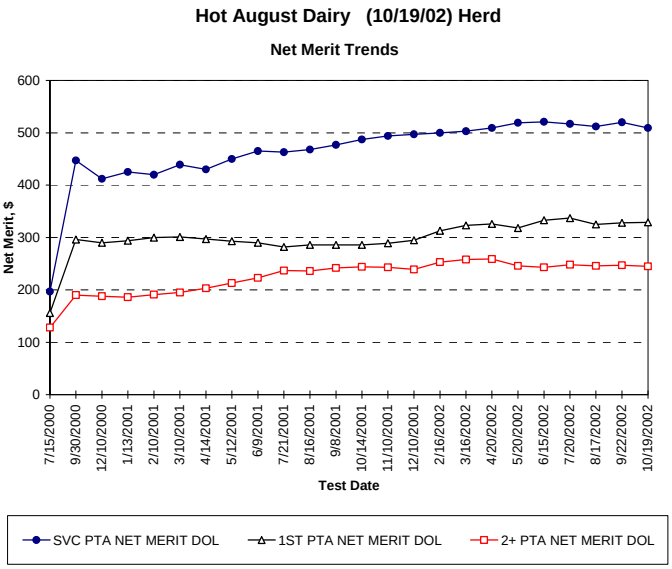
Questions:

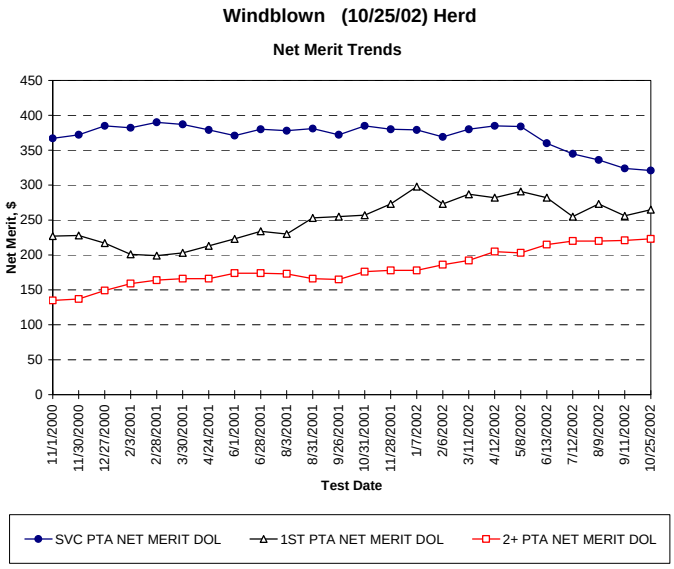
1. How does the herd compare to current industry standards indicated on the graph?

2. Are the subgroups separated as expected, i.e., is there any subgroup that is clearly superior or inferior to industry standards?

3. Are current semen selection practices sufficient to keep the herd capable of performing like the better contemporary herds in the industry?

21-NM$-h Example Herds:





Net Merit $ values from “Hot August Dairy” show that it is selecting very high performance bulls of very high NM$ value and the breeding program shows steady improvement. This pattern is also shown in the sires of the lactating cows which also exceed benchmarks of the higher production herds in the industry.

NM$ values from “Windblown Dairy” show a decline in the past 5 months in the average service sire (SVC) NM$ value of semen used to produce pregnancies. The spread between the service sires is closing with the NM$ value of the sires of the currently lactating cows, reflecting a failure to stay with the genetic trends of the industry. Recent semen selection practices will start to hurt production in about 2 years time.

Graph: 22-PTAM Previous ME305 vs. Sire PTA

Purpose:

To display the data and evaluate the impact of sire PTA milk on daughters performance in this herd.

Interpretive Comments:

Each dot represents a cow that has completed a full lactation. The dot is located at the intersection of her previous ME305 milk and the PTA Milk of her sire. In general, the daughters of bulls with the highest PTA milk should have the higher ME305 milk.

A regression line is plotted and is expected to go upward as it goes to the right, meaning that higher producing cows are sired by higher PTA milk bulls.

The regression formula y=ax+b supplies a value (a) which means that for every 1 pound of sire PTA milk, the herd realizes (a) pounds of ME305 milk.

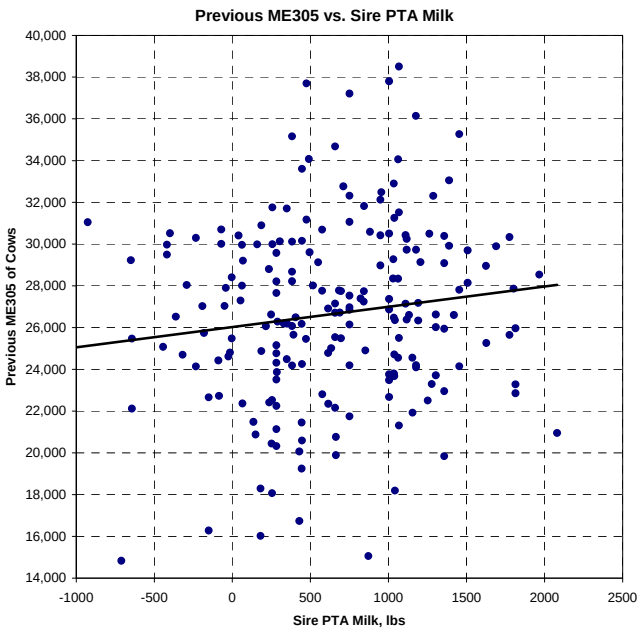
Questions:

1. Is there a relationship between the individual cow performance and her sire's PTA value in the herd?

2. Where on the graph would cows culled for low production most likely have appeared if they were still in the herd?

22-PTAM Example Herds:

Professor (02/19/01) Cow



205 2+ Lactation Cows

174 2+ Lactation Cows with Identified Sire (PTA > 0)

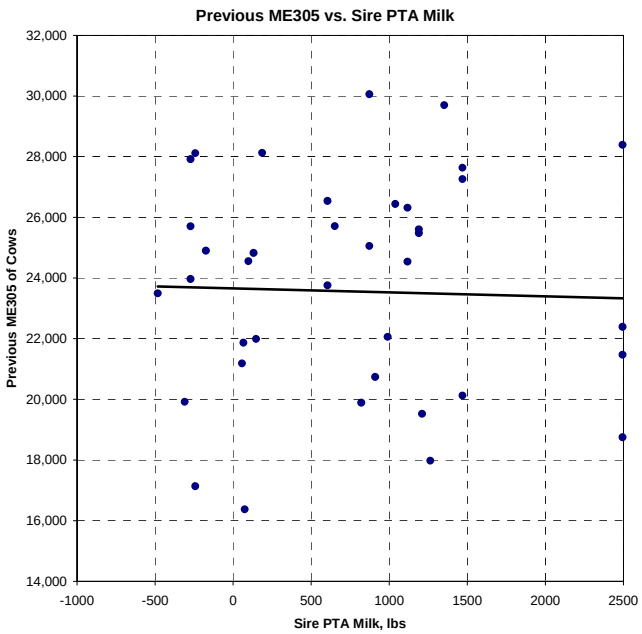
$y = 0.9734x + 26026$

$R^2 = 0.0199$

Selection Criteria:

Previous ME305>=1, Sirer PTA milk lbs. <>0

Wounded Knee (02/15/01) Cow



39 2+ Lactation Cows

31 2+ Lactation Cows with Identified Sire (PTA > 0)

$y = -0.1307x + 23658$

$R^2 = 0.0008$

Selection Criteria:

Previous ME305>=1, Sirer PTA milk lbs. <>0

"Professor Dairy" shows a wide variation in response, but for each pound of sire PTA milk, the herd realizes .97 pounds of ME305 milk. This value comes from the regression formula below the graph.

"Wounded Knee Dairy" shows a very uncertain response to high milk bulls, with a loss of 0.13 pound ME305 milk for each pound of sire PTA milk. The regression suggests that the daughters of higher genetic value bulls milk less than the daughters of lower value bulls. This herd has had a long-term problem with hepatic lipidosis and ketosis. It is possible that the daughters with the greatest potential to produce milk are experiencing the most severe liver disease and ketosis, producing this very unusual result.

Graph: 23-Mast Subclinical Mastitis Data

Purpose:

To monitor herd SCC as well as linear scores of parity subgroups over time.

Interpretive Comments:

Average somatic cell count (SCC) in Wisconsin is about 300,000.

The average linear score of AgSource Holstein herds is 3.0, with the lowest producing herds averaging 4.0 and the highest producers at 2.8.

The AgSource Holstein average for first lactation cows is 2.6 and second and greater lactation cows is 3.2.

Suggested goals for first lactation cows are 2.0 and older cows are 3.0.

Questions:

1. Characterize the SCC of this herd relative to industry averages.

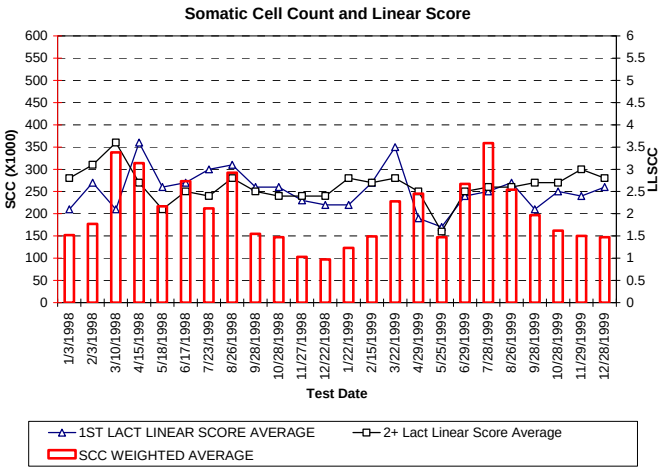
2. Is the difference between first lactation and older cows normal or unusual?

3. Does there appear to be a seasonal effect?

4. Has the current herd status changed in any substantial way?

23-Mast Example Herds:

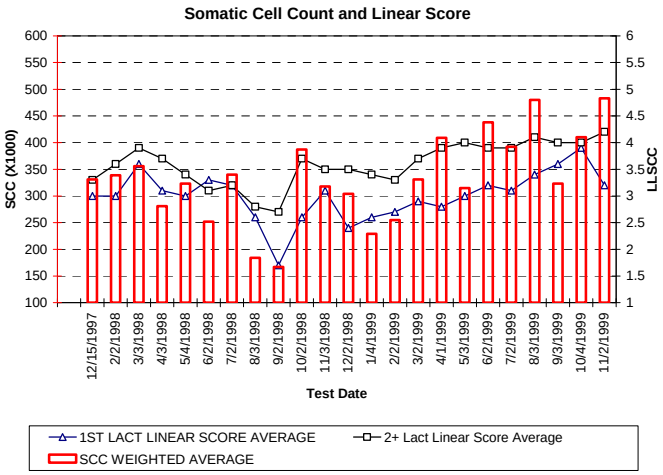
Grazier (12/28/99) Herd



	Your Herd	Target
Average 1ST LACT Linear Score (last 12 months) = 2.4	2.0	
Average 2+ LACT Linear Score (last 12 months) = 2.6	2.5	
Average Weighted SCC (last 12 months) = 209	150	

"Grazier" shows a range in SCC from about 100,000 to 350,000 over the past year. Through much of the past year and a half, the first lactation cows have shown linear scores very similar to the older cows, which is unusual in that older cows usually have higher linear scores. Overall SCC trends are quite stable over the past year and a half.

Slipping (11/02/99) Herd



	Your Herd	Target
Average 1ST LACT Linear Score (last 12 months) = 3	2.0	
Average 2+ LACT Linear Score (last 12 months) = 3.7	2.5	
Average Weighted SCC (last 12 months) = 359	150	

"Slipping Dairy" is steadily losing ground with mastitis control over the past year. In particular, the first lactation cows appear to increasing dramatically, except for the downward change in the last test.

Graph: 24-Rates Prevalence and New Infections

Purpose:

To monitor the prevalence of mastitis infections and the rate of new infections on each test date.

Interpretive Comments:

A cow is considered to be infected if the SCC is 200,000 or greater.

Cows that were infected on the prior test and again on the current test are counted in the upper colored band. These can be considered "chronic" infections.

Cows that were not infected at the previous test, but infected at the current test are counted in the striped bands and are called "new infections".

Cows that were infected at the first test are indicated by the lower striped band. In practical terms, these can be considered to be primarily infections that were acquired or not cleared during the dry period or pregnant heifer phase.

Interpretive benchmarks for the herds with the best mastitis control are incorporated into the report on the bottom of the page.

Questions:

1. What is the overall prevalence of infection in the herd?

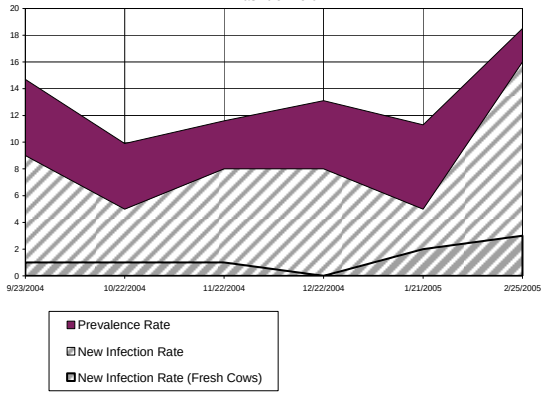
2. Are there more cows in the new infection group or the chronic group?

3. Of the new infections, do more of them appear to be coming from the dry or pregnant group or from the lactating herd?

24-Rates Example Herds:

Recent Problem 35590014

Prevalence and New Infection Rate, as % of Herd



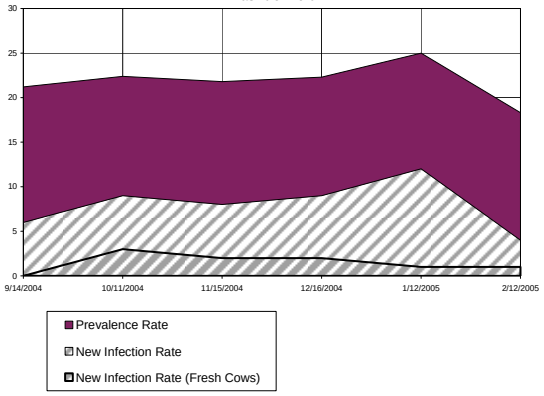
6 Month Summary of Data

Test Date	6 Month Average	Target Rates at 150 SCC	Definitions
Days between tests	32		
Wtd Ave SCC X 1000	127	150	Mean SCC of cows on test, weighted by milk production
Prevalence Rate % of herd	13 %	17 %	Proportion of infected cows (>200,000) in herd
% of Prevalence due to Chronic Infection	38 %	50 %	Proportion of Prevalence >200,000 in the last 2 or more consecutive tests
Herd New Infection Rate %	9 %	9 %	New infections (>200,000) in cows uninfected (<200,000 or nonlactating) at the previous test
Proportion of New Infections due to Fresh Cows	15 %		Fresh cow infections as a proportion of total new infections
Proportion of Fresh Cows Infected at first test	13 %	15 %	

While the overall prevalence at "Recent Problem Dairy" has been very good at 13%, there has been a dramatic increase in the past month. The graph suggests that the problem may have started with a sudden increase in fresh cow infections in January, and a big increase in the new lactating cow infections by the February test. They could be independent problems, or it could be a contagious problem introduced from the fresh cows. However, very few of the infections become chronic. A close look at dry cow management, as well as milking practices is in order.

Old Chronics 35360118

Prevalence and New Infection Rate, as % of Herd



6 Month Summary of Data

Test Date	6 Month Average	Target Rates at 150 SCC	Definitions
Days between tests	31		
Wtd Ave SCC X 1000	267	150	Mean SCC of cows on test, weighted by milk production
Prevalence Rate % of herd	22 %	17 %	Proportion of infected cows (>200,000) in herd
% of Prevalence due to Chronic Infection	63 %	50 %	Proportion of Prevalence >200,000 in the last 2 or more consecutive tests
Herd New Infection Rate %	10 %	9 %	New infections (>200,000) in cows uninfected (<200,000 or nonlactating) at the previous test
Proportion of New Infections due to Fresh Cows	20 %		Fresh cow infections as a proportion of total new infections
Proportion of Fresh Cows Infected at first test	17 %	15 %	

While the overall prevalence of infected cows at "Old Chronics Dairy" has been kept at a good 22%, most of the infected cows are chronics. The risk of new infections is quite low. This dairy appears to have good mastitis prevention practice. Efforts to cure or cull the infected cows could yield impressive increases in somatic cell count premiums from the milk plant.

Graph: 25-DryCow Dry Cow and Heifer Summary

Purpose:

To summarize the changes in mastitis status of cows during the dry period and the status of replacement heifers entering the herd.

Interpretive Comments:

Three groups of cows are summarized. As before, a SCC greater than 200,000 is considered to represent an infected cow.

First, the prevalence of infection in cows that were uninfected at their last test before going dry is reported. These would be new infections acquired during the dry period or during the first days of the lactation prior to the first test. The goal is less than 10%.

Second, the rate of uninfected cows at first test in the group of cows that were infected at the last test prior to their dry period represents the "cure" rate during the dry period. The goal is greater than 70% with appropriate dry treatment therapy and good environmental management.

Third, the prevalence of heifers entering their lactation infrected is reported. The goal is less than 10%.

Questions:

1. Do "clean" cows appear to acquire mastitis during the dry period?

2. Do dry treatment practices appear to be effective at clearing infections?

3. Do heifers entering the herd meet our goal for low infection rates?

25-DryCow Example Herds:

Recent Problem 35590014

Dry Cow and Heifer Summary

	Uninfected cows at dry off (85)	Infected cows at dry off (37)	Lactation 1 (Heifers) (82)	Target	Intervention
New Infections at first test	11% (9)	(8)	9% (7)	<10%	>15%
Dry Cow Cures		78%		>80%	<70%

( ) = Absolute # of cows >200,000 at 1st test

Prevalence and New Infection Rate, as % of Populations at Risk

Test Date	9/23/2004	10/22/2004	11/22/2004	12/22/2004	1/21/2005	2/25/2005
Days between tests	34	29	31	30	30	35
Wtd Ave SCC X 1000	153	108	160	89	83	169
Prevalence, No.	23 / 156	16 / 162	20 / 172	23 / 175	13 / 115	33 / 178
% of herd	15 %	10 %	12 %	13 %	11 %	19 %
Chronic, No.	9 / 23	8 / 16	7 / 20	9 / 23	7 / 13	4 / 33
% of prevalence	39 %	50 %	35 %	39 %	54 %	12 %
New Infection, No.	14 / 138	8 / 145	13 / 158	14 / 158	6 / 105	29 / 167
All cows %	10 %	6 %	8 %	9 %	6 %	17 %
Proportion of New	1 / 14	1 / 8	2 / 13	0 / 14	2 / 6	6 / 29
Infections due to Fresh cows	7 %	13 %	15 %	0 %	33 %	21 %
Proportion of Fresh Cows	1 / 18	1 / 19	2 / 14	0 / 11	2 / 12	6 / 16
Infected at first test	6 %	5 %	14 %	0 %	17 %	38 %

From the lower table, the increase in prevalence rate in February is related to an increase in new infection rate from 6% to 17%. Fresh cow infection rate at first test has exceeded target for the last 2 months and is contributing to the increase in somatic cell count.

Historically, the top table shows that over the past six months, this dairy was achieving targets for minimal infections at first test. The problem had a very recent onset.

Old Chronics 35360118

Dry Cow and Heifer Summary

	Uninfected cows at dry off (99)	Infected cows at dry off (53)	Lactation 1 (Heifers) (104)	Target	Intervention
New Infections at first test	21% (21)	(12)	15% (16)	<10%	>15%
Dry Cow Cures		77%		>80%	<70%

( ) = Absolute # of cows >200,000 at 1st test

Prevalence and New Infection Rate, as % of Populations at Risk

Test Date	9/14/2004	10/11/2004	11/15/2004	12/16/2004	1/12/2005	2/12/2005
Days between tests	32	27	35	31	27	31
Wtd Ave SCC X 1000	287	323	214	216	332	233
Prevalence, No.	42 / 198	47 / 210	45 / 206	47 / 211	58 / 232	43 / 235
% of herd	21 %	22 %	22 %	22 %	25 %	18 %
Chronic, No.	30 / 42	28 / 47	27 / 45	27 / 47	31 / 58	33 / 43
% of prevalence	71 %	60 %	60 %	57 %	53 %	77 %
New Infection, No.	12 / 154	19 / 174	17 / 167	20 / 175	27 / 189	10 / 184
All cows %	8 %	11 %	10 %	11 %	14 %	5 %
Proportion of New	0 / 12	7 / 19	5 / 17	4 / 20	3 / 27	2 / 10
Infections due to Fresh cows	0 %	37 %	29 %	20 %	11 %	20 %
Proportion of Fresh Cows	0 / 12	7 / 25	5 / 16	4 / 22	3 / 28	2 / 17
Infected at first test	0 %	28 %	31 %	18 %	11 %	12 %

The lower table shows that infection dynamics in this herd are dominated by chronic infections (cows greater than 200,000 SCC for the last 2 tests). New infection rate decreased last month, resulting in a reduction in the prevalence rate and somatic cell count.

Historically, 21% of the cows that entered the dry period uninfected had become infected by their fist test date, compared to 15% of the heifers. This suggests that either dry cow treatment practices or the dry cow environment might be improved.

Graph: 26-Bulk Tank Bulk Tank Contribution

Purpose:

To identify the cows making the greatest contribution to the bulk tank SCC.

Interpretive Comments:

Cows are arranged in order of total contribution to the bulk tank SCC at the latest test.

Other information is provided in order to make culling decisions including lactation number, days in milk, ME305 milk, milk on last test, and the number of times in the last 7 tests that the cows's SCC has been over 200,000.

Major contributors to the bulk tank SCC that have a lower than herd average ME305 and have chronic infections should be evaluated carefully for culling.

Questions:

1. Are there any cows that should be removed immediately? Which ones?

2. If removed and nothing else changed, what would the new herd SCC become?

26-Bulk Tank Example Herds:

Big Year
Bulk Tank SCC Contributions

COMPUTER NUMBER	BARN NAME	CURRENT LACTATION NUMBER	CURRENT DAYS IN MILK	CURRENT ME305 MILK LBS	TEST DAY MILK LBS	TEST DAY SCC	Current Test Bulk Tank contribution %	Number of Tests >200,000 during last 7 tests
899	54Y	3	17	20,413	92	2703	21.0	2
905	S20	3	47	16,640	70	2107	12.5	3
977	26ST	6	207	18,898	39	2042	6.7	7
988	38ST	3	28	20,369	94	794	6.3	2
818	355	5	126	16,261	61	1167	6.0	2
775	KS	6	212	15,687	35	1107	3.3	7
1026	S43	1	83	23,358	78	446	2.9	1
947	13	2	197	19,976	49	501	2.1	7
978	27ST	10	71	19,348	80	306	2.1	3
784	KR	6	136	15,142	59	356	1.8	4
1020	S37	1	126	20,403	63	299	1.6	3
915	S7	3	8	15,179	47	351	1.4	1
1027	120	1	78	22,115	80	199	1.3	0
864	98-Y	6	348	30,192	57	266	1.3	6
1036	676	1	29	13,918	35	424	1.3	1
1013	O16	2	201	16,933	47	315	1.3	4
1038	683	1	28	18,369	55	247	1.1	1
1000	52ST	2	194	29,806	76	172	1.1	0
1005	O18	1	281	25,721	51	238	1.0	1
983	33ST	3	17	15,994	59	183	0.9	0
780	KK	6	223	24,047	61	167	0.9	1
1001	53ST	4	198	19,719	55	181	0.8	0
888	90W	4	366	22,157	18	545	0.8	3
845	12-Y	7	36	13,262	47	208	0.8	3
982	32ST	7	96	22,170	94	93	0.7	2
1024	667	1	105	17,887	53	142	0.6	1
911	23Y	3	0	0	51	143	0.6	1
949	57Y	2	50	20,176	86	82	0.6	0
893	29Y	3	248	28,824	84	83	0.6	0
997	49ST	2	200	16,714	27	258	0.6	3
829	373	4	96	15,119	61	107	0.6	2
908	S8	3	184	26,934	76	85	0.5	2
878	46G	3	223	20,021	49	123	0.5	1
986	36ST	2	202	23,980	61	98	0.5	0
922	312	2	262	24,070	43	138	0.5	4
972	20ST	7	41	19,164	84	69	0.5	0
909	S-12	2	388	21,465	25	222	0.5	3
822	XX	4	251	25,162	70	78	0.5	0
824	382	4	221	23,419	53	96	0.4	0
931	72Y	2	271	26,158	59	83	0.4	0
989	39ST	5	271	17,082	53	90	0.4	0

"Big Year Dairy" is a relatively low prevalence herd, relatively stable although there are more new infections than resolved, and the fresh cows are entering the current lactation free of infection.

Graph: 27-SCC Individual SCC

Purpose:

To present individual cow SCC counts for detailed examination.

Interpretive Comments:

Any SCC greater than 200,000 is shaded.

"#NA" means not applicable and that the animal had note entered the herd at that test date. Usually these are first lactation cows that entered the herd in the past 6 months, but they can represent mature cows recently purchased. The lactation number is reported for each animal.

"NT" means "not tested" and usually signifies that the cow was dry at the time of the herd test, or was not available due to sickness or other reasons.

Questions:

27-SCC Example Herd:

Big Year

Individual Cow SCC Record

COMPUTER NUMBER	BARN NAME	CURRENT LACTATION NUMBER	9/17/00	10/21/00	11/20/00	12/18/00	1/20/01	2/17/01	TEST DAY DAYS IN MILK
1034	79	1	#N/A	#N/A	#N/A	#N/A	37	45	51
1037	85	1	#N/A	#N/A	#N/A	#N/A	#N/A	71	20
1007	113	1	912	193	207	256	114	NT	0
1027	120	1	#N/A	#N/A	#N/A	71	120	199	78
1011	124	1	10	13	25	24	152	20	193
1012	125	1	209	212	227	174	752	87	197
1035	664	1	#N/A	#N/A	#N/A	#N/A	88	7	52
1024	667	1	#N/A	#N/A	570	58	13	142	105
1017	669	1	#N/A	185	61	104	57	14	139
1022	672	1	#N/A	69	9	4	7	11	146
1019	674	1	#N/A	23	44	13	11	5	145
1018	675	1	#N/A	79	73	12	176	48	125
1036	676	1	#N/A	#N/A	#N/A	#N/A	#N/A	424	29
1031	677	1	#N/A	#N/A	#N/A	#N/A	138	14	52
1025	678	1	#N/A	#N/A	#N/A	50	9	7	86
1038	683	1	#N/A	#N/A	#N/A	#N/A	#N/A	247	28
952	3346	1	13	5	8	9	55	NT	0
966	14ST	1	7	19	8	6	NT	NT	0
968	16ST	1	2	16	9	19	17	14	425
941	42Y	1	8	12	22	11	45	57	567
1010	BROCH	1	5	17	21	18	21	14	194
1030	BT	1	#N/A	#N/A	#N/A	#N/A	74	69	53
1005	O18	1	120	63	91	143	62	238	281
1004	O19	1	204	148	324	212	1789	NT	0
1016	S31	1	3382	27	52	12	22	56	160
1020	S37	1	#N/A	166	261	110	509	299	126
1029	S41	1	#N/A	#N/A	#N/A	#N/A	5	18	54
1028	S42	1	#N/A	#N/A	#N/A	86	16	4	80
1026	S43	1	#N/A	#N/A	#N/A	105	175	446	83
1033	S49	1	#N/A	#N/A	#N/A	#N/A	261	7	50
1032	S50	1	#N/A	#N/A	#N/A	#N/A	15	14	51
947	13	2	893	1036	655	437	402	501	197
927	14	2	107	90	77	143	78	86	335
924	15	2	211	186	227	279	352	NT	0
925	16	2	240	286	418	434	NT	NT	0
944	19	2	18	11	54	79	47	70	221
946	20	2	74	10	42	19	62	56	176
939	21	2	NT	53	12	4	6	2	144
932	23	2	5	3	9	88	7	20	199
942	24	2	9	73	2191	10	25	7	271
921	25	2	57	68	108	65	98	105	261

Graph: 28-TCIList Individual Cow TCI

Purpose:

To present individual cow TCI™ scores for detailed examination.

Interpretive Comments:

Only 60 cows are listed, starting with the most negative score.

Status codes are presented next to the TCI™ score. Status code=1 means the cow is currently in the herd. The status codes >20 are explained at the bottom of the page and are assigned at the time of culling.

Questions:

28-TCIList Example Herd:

Hilltopper (060707)

Individual Cow TCI (60 cows maximum), starting with most negative values

	Comp No.	Barn name	Lact No.	Calving Date	Days in Milk	Previous ME305	First ME305	Last SCC	First SCC	First Fat %	First FPR	TCI	Status Code
1	927	AHNA	6	11/4/2006	203	34207	1847	0	0	2922	394.9	-15883	1
2	1176	SIERRA	3	5/9/2006	256	34612	9804	287	17002	108	23.0	-11598	24
3	1223	JUSTINA	2	6/29/2006	35	38593	8361	1055	16422	25	3.1	-10589	26
4	1177	BAILEY	3	6/1/2006	75	31533	7019	66	17002	255	79.7	-9847	24
5	727	SOCKS	8	10/21/2006	217	22455	5670	2149	0	96	24.6	-9199	1
6	1269	PAULA	3	2/14/2007	101	24905	7861	216	17103	52	9.0	-9136	1
7	1302	HONEY	3	3/15/2007	72	32608	12729	82	19200	85	17.3	-9013	1
8	1216	ANGELA	3	5/23/2006	368	39512	12354	574	21529	51	7.6	-8305	1
9	1261	PIPPY	3	9/24/2006	244	29296	6442	884	17008	123	24.1	-8299	1
10	1195	CRICKET	6	11/7/2006	200	35039	9571	502	18289	939	204.1	-7179	1
11	1151	HAZEL	4	4/7/2007	49	30923	11654	164	20622	78	11.1	-6379	1
12	1275	MARA	3	1/15/2007	131	27082	8824	340	19936	241	25.9	-6343	1
13	1240	LUNA	3	7/14/2006	316	33554	10376	129	19788	99	29.1	-6128	1
14	695	LATHER	8	10/25/2006	213	29619	10318	356	18324	704	130.4	-5834	1
15	1126	RHEVA	6	12/4/2006	173	23261	10506	1374	18274	517	105.5	-5474	1
16	1404	MONEY	2	4/4/2007	52	37014	13192	167	22519	38	6.8	-5208	1
17	1138	ROBERTA	6	3/26/2007	61	28757	13385	140	20606	76	19.5	-5187	1
18	928	LISA	7	10/26/2006	212	25818	10295	93	17524	532	102.3	-5099	1
19	1314	KAMMY	3	2/18/2007	97	31340	13206	335	21851	92	16.1	-4750	1
20	1464	KAREN	2	3/28/2007	59	32739	14087	31	23606	22	4.9	-4340	1
21	1654	TRISH	2	9/14/2006	254	37915	13993	41	23319	43	10.2	-4162	1
22	1270	LOVE	2	6/4/2006	356	37043	12148	34	21118	122	18.5	-4136	1
23	1336	MELANIE	2	5/29/2006	69	32564	12798	63	23170	89	18.5	-4092	26
24	1277	GAYLA	3	2/19/2007	96	32309	14306	74	22315	187	41.6	-4064	1
25	1330	AMERICA	2	6/27/2006	320	29210	13549	160	20956	12	3.0	-3831	6
26	1113	BEVIE	4	8/23/2006	276	27697	15217	131	20351	21	4.7	-3788	1
27	947	JOLLY	5	5/21/2006	370	30887	15214	247	22698	26	6.0	-3505	1
28	926	BEV	6	5/25/2006	84	24672	12686	737	20977	45	8.2	-3344	24
29	1086	JULIE	6	6/29/2006	316	35066	16912	166	22689	77	29.6	-3288	24
30	1300	JOCELYN	3	4/3/2007	53	31883	15810	105	23717	92	18.4	-2838	1
31	1284	LILIA	2	5/28/2006	363	37504	15793	55	24481	35	8.3	-2726	1
32	1347	SONJA	2	4/20/2007	36	34024	17249	223	23038	100	26.3	-2458	1
33	1630	SALENA	3	1/29/2007	117	26786	16611	248	21155	24	5.6	-2328	1
34	759	LINDSEY	7	2/3/2007	112	29136	16817	142	22624	102	23.7	-2250	1
35	1276	JUDITH	2	5/2/2006	128	25881	17391	76	23225	43	11.0	-2167	21
36	968	JEAN	8	5/16/2007	10	27734	13298	88	23042	1211	403.7	-2161	1
37	1388	IRELAND	2	3/23/2007	64	32574	16509	102	22676	27	6.1	-2086	1
38	1355	JESSIE	2	8/26/2006	273	36338	18023	83	24498	23	6.4	-1923	1
39	1279	SUNNY	3	5/6/2007	20	29457	16321	53	23135	25	5.7	-1817	1
40	1139	MARTINE	6	5/17/2007	9	35421	16793	165	24745	73	14.0	-1672	1
41	1257	HILLARY	3	1/3/2007	143	37803	17761	833	23919	1481	389.7	-1524	1
42	948	LAMBO	5	9/5/2006	263	25962	15181	1993	21050	2380	595.0	-1411	1
43	911	ALERT	7	10/5/2006	233	34126	20126	519	24576	27	6.6	-1361	1
44	930	KINDLE	5	3/12/2007	75	29141	19021	532	23089	17	3.6	-1222	1
45	1103	FRITZI	4	8/13/2006	286	29147	13252	532	21885	86	26.1	-1185	1
46	1185	BRITANY	4	2/20/2007	95	25081	15023	128	22467	175	33.7	-1085	1
47	1061	JONI	5	5/7/2007	19	28613	16846	108	23580	27	8.4	-1019	1
48	1463	ALLIE	2	5/8/2007	18	28325	15705	23	25357	24	6.3	-965	1
49	1258	BONUS	3	9/17/2006	251	35222	16164	130	23209	54	12.3	-941	1
50	1424	LYNN	2	1/16/2007	130	33381	15431	20	25965	71	13.7	-934	1
51	1225	BIRDY	3	11/30/2006	177	34648	18144	97	23157	18	4.2	-829	1
52	1403	SUZZY	2	12/2/2006	175	27133	16568	16	24686	28	6.5	-788	1
53	666	FRITZIE	8	8/27/2006	272	30069	17384	113	24236	27	8.4	-786	1
54	1290	FELICE	3	3/20/2007	67	37766	21754	64	26120	9	2.9	-767	1
55	1171	JADA	3	8/7/2006	85	31310	15208	738	21848	38	11.2	-719	24
56	1429	HANCOCK	2	4/4/2007	52	31756	16351	271	25575	58	14.5	-708	1
57	1312	MAGGY	2	9/18/2006	250	31116	14096	1381	21690	34	8.3	-667	1
58	1338	HONDA	2	7/19/2006	311	32955	14540	12	24448	407	94.7	-576	1
59	1264	SID	3	10/29/2006	209	36521	18636	2	24371	14	3.3	-541	1
60	1047	SEARS	5	10/30/2006	208	27459	15810	522	22070	82	14.9	-539	1

Status codes:

21=dairy	23=reproductive problems	25=mastitis or udder problem	27=feet/leg
22=low production	24=disease, injury, other	26=died	28=dispostion