

10 IMPORTANT MEASURES

Understanding Dairy Herd Performance Measurements from the Agri-Tech Analytics DHIA Herd Total Report

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The following are 10 important measures of a herd's production performance, including milk, butterfat and protein production, breeding efficiency, milk quality as it relates to udder health, and cow turnover.

Dairy producers may place these in different order, but collectively they represent the effective measures of herd performance. Of key interest is trend analysis. That is, when you use these measures, the most valuable information is from analyzing the direction of these numbers.

This may be comparable to a balance sheet net worth figure determined at year's end. You are helping answer the question: "Are these measures moving towards the goals I have set?"

When looking at these herd figures on the DHIA (Dairy Herd Improvement Association) Herd Total Report, keep in mind that the number is important. But by comparing progress in the previous 12 months, you can measure

your progress toward a more profitable dairy enterprise.

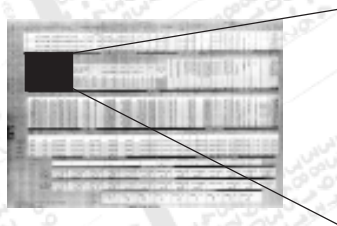
Here are the 10 measures and a brief description of each. All are found on the *Herd Total Report*. Accompanying each measure description is a duplication of the computer printed block found on the report.

1. Pounds of milk for milking cows

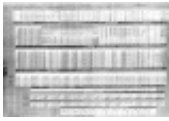
This is probably the *single most important* number on the whole page. This number is adjusted to a 30-day interval basis because intervals vary from test period to test period. Adjusting this number allows a more accurate comparison between time periods. Eleven additional numbers are included, providing a glance at the previous 12 months' production.

One question dairy producers might ask is: "After allowing small seasonal changes, is my herd increasing, decreasing, or just stable?"

AVG. DAILY HERD PROD.					
S	TEST DATE	ALL COWS		MILKING COWS	
		MILK	FAT	MILK	FAT
	41093	77	2.97	83	3.20
	30393	73	2.83	83	3.20
	20393	63	2.43	79	3.03
	10693	60	2.40	74	2.93
	12079	59	2.37	69	2.80
	11049	59	2.37	69	2.77
	10029	59	2.37	70	2.80
	9019	64	2.50	73	2.83
	7269	63	2.40	73	2.80
	7019	63	2.43	74	2.80
	5299	67	2.53	74	2.77
	4239	68	2.43	78	2.80



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YEARLY AVERAGES												
MILK	ALL COWS				ADJUSTED 365 DAY AVERAGE				MILKING COWS			
	FAT	SNF/PROT.	FCM		MILK	FAT	SNF/PROT.	FCM	% FAT	% SNF /PROT.	% DRY	% DIM
23692	916	790	25100		27321	11056	917	28940	3.87	3.26	11.3	86.7
23253	892	771	24521		26882	1031	897	28345	3.84	3.24	13.5	86.5
23205	886	764	24403		26877	1026	890	28261	3.82	3.31	13.7	86.3
22290	859	727	23569		26136	1008	852	27649	3.86	3.26	14.7	85.3

2. Rolling herd average (RHA) for all cows adjusted to a 365-day period

This is the figure dairy producers quote when someone asks for the total amount of milk produced per cow for the previous year.

There are several herd averages on this page. The others help measure

your herd with other herds, as the variations in fat production, (fat-corrected milk or FCM), or age of cows (mature equivalent or ME) are given on an equivalent basis.

For an individual dairy producer, the standard rolling herd average is a measurement of the total amount of milk produced by all cows in the previous 365 days divided by the number of cow years in the herd.

The dairy producer may also look at the previous three quarters RHA for the herd.

The advantage of this RHA is that it is a record of the actual amount of milk produced per cow during the previous year. A dairy producer compares this figure with a previous RHA and can determine if the herd is increasing, decreasing, or staying the same.



COW YEARS	% LEFT HERD
135.5	30.5
135.6	44.0
137.7	48.4
138.43	44.6

3. Percent left herd

This is cow turnover or culling. It is calculated by dividing the total number of cows leaving the herd during the previous 365 days by the number of cow years.

The national average is about 33 percent. This means cows last just under three lactations in the average herd. What should this figure be? Certainly if a herd is expanding to fill facilities, then 33 percent is high.

Some herds are under 20 percent.

This can be done by managing the herd differently and accepting some poorer type cows that may otherwise be culled. A herd that has very little subclinical mastitis and sporadic clinical cases usually will have less culling for mastitis reasons.

Well bred cows with above average emphasis on conformation mean cows with good udder traits, strong physical structure, and sound feet and legs will stay in the herd longer. And a good

breeding program means cows are not leaving the herd for reproductive reasons.

This is a complex answer, with every dairy producer having a rationale for each culling decision. When milk prices are unusually low, most dairy producers cull more than normal to pay bills. Whatever the case, culling or cow turnover is a *major decision* for dairy producers. These animals also provide between 10 and 12 percent of the total income.

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MILK QUALITY											
% L2	1	2	3	4	5	6	7	8	9	SCC	L2
0	N			T			2 & 3			AVG.	AVG.
% CMT											
<-----	79	17				3				57	22
<-----	74	15			4	4				92	29
<-----	52	28	7		7	7				112	32
<-----	77	8		8	8					110	31
<-----	45	45		9						125	35
<-----	58	17	25							74	23
<-----										103	30
<-----	66	21	6	3	3					103	30

4. Average Somatic Cell Count (SCC)

This figure is a measure of *udder health* in the herd. A number less than 100,000 is most desirable. There are actually three measures of somatic cells. The California Mastitis Test (CMT) is a reliable cow-side test that is fast, inexpensive, and easy to do. The L2 score is a computer generated number based on the logarithm score (daily producers do not usually use the L2 score when talking about SCC's).

The SCC is the number of somatic cells in one milliliter of milk. The

number is calculated instead of actually measured (individual samples are measured electronically in the laboratory) and represents the average value for the entire milking herd.

Somatic cells come from two sources: the *udder tissue* itself and as accumulated *white blood cells* that arrive from the immune system. They fight bacteria trying to establish an infection. Higher than normal numbers represent a cow attempting to fight infection.

The immune response is desirable, but your management effort should

be directed toward *preventing* infection. Milk that is high in SCC will degrade faster, and shelf life is shorter.

A goal for your herd average should be under 100,000. Co-ops are paying quality bonuses for lower SCC. This number is very important in that it measures the level of infection and, therefore mastitis in the herd. The Herd Total Report provides a look at the previous 11 months, so you can monitor the *direction* of this number.

(The next three measures are included in the breeding block of the herd total report, which appears at the end of measure number seven.)

5. Average calving interval months.

The meaning of this figure has changed during the last few years. A standard of 280 days is used for the gestation period, that is, from conception to calving. If cows are bred and conceive 85 days after calving, then 280 plus 85 equals 365. Hence we have a calving interval of 12 months, which means the cow calving on

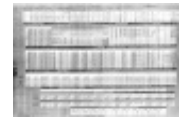
April 20 this year will calve on the same day next year.

Is this desirable? Yes, but not realistic. Most calving intervals are at least 13 months long. As cows move to higher production, especially on three times a day milking, getting cows pregnant is more difficult. The calving interval is calculated by taking the average days open, adding 280 days, and

dividing by 30 days in a month. Thus every 30 days past 85 days adds another month to the calving interval. Pay attention to this figure if production is below breed average.

You can accept a bit longer calving interval if a herd is on three times a day milking, or daily production on two times a day exceeds 70 to 72 pounds for a Holstein herd. *But you can accept it only to a point.*

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6. Average days open

As with the previous calving interval, this figure really tells the dairy producer at what point after calving cows are conceiving, that is, settling with a confirmed pregnancy. This figure is calculated by counting the number of days between calving and a breeding date resulting in a confirmed pregnancy.

If a dairy producer does not check to determine if cows are pregnant, the computer will add the cows to this

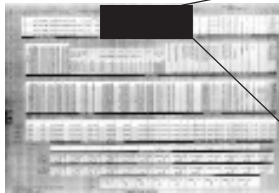
calculation that have gone 90 days from the previous breeding date without a new breeding date reported.

Dairy producers can choose not to have a cow included in this calculation by coding her DNB or Do Not Breed.

The DNB code lets a cow exist in the herd. She will not be bred (a management decision), and will not count in the calculation of average days open. This is important if a dairy producer selects cull cows but chooses to keep

them in the herd for some portion of their lactation.

Many dairy producers make this determination at some point but may choose to keep the cow around for awhile. By not breeding her, she maintains a slightly higher milk flow because she is not pregnant. As with all culling decisions, this is a complex determination, but it does allow a more accurate number by including just the cows that are being bred back for another pregnancy.



AVG. AGE AT CALVING	AVG. DAYS		NO. COWS OPEN UNDER 100 DAYS	BREEDING			SERVICE/CONCEPT 90 DAYS OR MORE IN HERD	AVG. CALVING INTERVAL MONTHS	
	IN MILK AT FIRST DRY	AVG. DAYS AT FIRST BREEDING OPEN		NO. COWS OPEN 100-130 DAYS	NO. COWS OPEN OVER 130 DAYS	HERD			
	DAYS	DAYS		PERCENT	PERCENT	PERCENT			
2-01	86	105	74	8	7	9			
3-01	57	86	109	81	11	6	7	1.47	12.52
4-10	59	85	113	65	18	5	9	1.75	12.49
3-04	58	83	118	69	47	8	4	1.61	12.50

7. Average days in milk at first breeding

This is simply the number of days after calving the cows are bred for the first time. This is calculated by taking the number of days between calving and the first reported breeding service.

This figure is important in that it tells the dairy producer whether heat detection and the overall post-calving period is progressing ideally, this

figure should be an average of 55 to 60 days. Remember, if all cows are bred on day 95 and settle, then a calving interval will be 12 months. By starting 60 days after calving, a dairy producer can accept the fact that at best only 50 percent of the cows will settle, on average, at any given breeding.

As with the calving interval, three times a day milking or high production on two times a day milking, this figure will be longer on these herds.

A good way to look at these breeding figures is a cow satisfies her maintenance requirement first, then produces milk if she has the body condition and genetic potential necessary to do so. Reproductively, this cow considers becoming pregnant a lower priority. Cows milking at 90 pounds of milk that are still losing weight have a small chance of becoming pregnant.

This is also a complex subject and one of the more challenging aspects of dairy herd management.

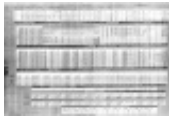
8. Average days in milk (DIM)

Conceptually, this is a hard number to picture. Average DIM represents the number of days the average milking cow in the herd is milking from

calving day. A number of 150 means the average milking cow is milking 5 months into her lactation. Since we normally consider the ideal lactation to be 305 days, this represents, then, a cow about halfway through her lactation.

On a herd basis, this means about half the cows are past the halfway point and have calved less than 150 days. This is all related to getting cows bred less than 115 days after calving and thus having a desirable calving

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COWS IN HERD	AVG DIM
134	150
141	134
140	143
141	152
137	166
138	169
134	168
138	170
132	169
133	172
137	158
135	154

interval. A calving interval of 13 months, for instance, will yield a DIM of 150 plus half a month: 15 days for a total of 165 days. *This is not the total story.* If a number on this sheet for a given month is very different from this, say 190 days, then this indicates a herd out of balance. That is, the herd does not have an *even flow* of fresh cows on a monthly basis. This is a factor in the larger herds.

The 190 days means the herd is a bit *stale*, with a higher than normal number of cows in the herd in late lactation. If they are pregnant, then the average DIM in 6 months will be much lower, indicating these cows have calved.

Prolonged periods of a long DIM number, over 180 days for instance, indicate a series of possible problems.

The first is probably breeding, but other factors can be responsible. One might be the introduction of new cows into the herd, all of which will or have calved in a short period of time.

As with the other measures, the interpretation of this figure is complex and must be used with the previous reproductive measures.



TEST DATE	1/10/93	3/03/93	2/03/93	1/06/93	12/07/92
FRESH COWS		12	11	10	8
AVG. MILK PRODUCTION	99.1	108.7	97.5	95.3	79.3

9. Fresh cows average milk production

Found at the bottom of the page, this is simply the production level of the cows calved since the previous test period. The number of cows in this category is provided also.

Fresh cows are usually the most profitable in the herd. Fresh cow performance not only is a measure of how they are doing right now, but how they did as a dry cow, how they

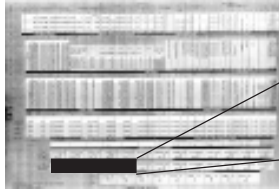
handled the stress of calving, and how well the nutrition program is working since calving. This figure is given for the previous months as well, so *trends* can be monitored.

What should this number be? In some Holstein herds today, that number is over 100 pounds per day. For an average, these cows should be at 90 pounds. While this value represents what peak milk per day might be, it is not the same as the peak or highest daily production. Peak milk usually occurs during the second month on test.

The Peak Production Report is a management report available that lists the actual peak milk produced by each cow in the herd. There are many factors influencing fresh cow average production.

The *trend or direction* is more important than the number itself. The number tells the dairy producer what his fresh cows are doing in terms of getting started on a new lactation. This figure does not include first-calf heifers entering the herd for the first time.

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TEST DATE	4/10/93	3/03/93	2/03/93	1/06/93	2/07/92
NO. OF FRESH HEIFERS	3	10	5	5	8
AVG. MILK PRODUCTION	80.7	70.5	68.2	68.5	67.9

10. Heifers average milk production

This is the same calculation as the above cow information but includes just the first-calf heifers entering the herd. This figure should be about 85 percent of the previously listed cow figure.

That would be about 77 pounds of milk for a new heifer. For herds milked three times a day, both the cow and heifer fresh milk averages could be 12 to 18 percent higher. As with the fresh cow average, the *direction* of the number is probably more important than the number itself.

Now that you have looked at these 10 important numbers, what can you conclude? Well, certainly *all these numbers must be looked at together*. The breeding information is all tied together in that each depends on another one. All are related to fresh cow and heifer average production. Somatic cells don't just tell us about udder health. They also tell us the level of economic loss from lost milk production due to mastitis.

With one number telling herd average tells you the herd production level for the past year. The average milk per cow per day tells you the latest production level on an individual cow basis.

Above all, remember DHIA is a measure of herd history—*what has happened*. It measures what went on during the last 12 months, or in the case of one management report, the *Herd Summary Review*, the previous 24 months. From this, you can measure the *direction* of a selected parameter. You can change management and then get the numbers going in the right direction.

DHIA is a tool of records, nothing more. If used properly, you can make progress. With that comes profitability. And you can take that to the bank.

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