The Reproductive Status of Your Dairy Herd

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The reproductive status of a dairy herd has a dramatic effect on a dairy's profitability and production. Reproductive problems can result in long lactations, long dry periods, or possibly both, thus minimizing profits for the dairy producer. However, the reason these profits were lost may not be easily detected without proper evaluation.

The two most important management factors relating to reproductive performance are heat detection and conception rates. Table 1 illustrates the maximum average number of days between calving and first breeding for a cow herd to maintain a 12.5-month calving interval under varying levels of heat detection accuracy and conception rates.

Table 1. Days from calving to first insemination to maintain 12.5-month calving interval as affected by heat detection accuracy (HDA) and conception rate.

% HDA	40	50	60	70
80	48	61	69	76
70	41	54	64	73
60	31	47	58	68
50	16	36	51	62
40	-36	29	37	52

% Conception rate

Evaluation of complete and accurate breeding and heat detection records can assist the dairy producer in achieving maximum reproductive efficiency in the herd. The following eight factors should be considered by the producer to effectively evaluate the reproductive performance of the herd.

DRY PERIOD LENGTH

Exceptionally long or short dry periods will adversely affect the profitability of individual cows. A short dry period will not provide adequate rest and time for mammary regeneration, while long dry periods will result in higher feed costs with no income from milk production. Long dry periods can also result in fat cows that are more prone to problems with health and reproductive performance. Each day dry over 60 days costs $3. However, each day dry under 40 days costs $2. Tables 2 and 3 show days dry in relation to milk production.

Table 2. Days dry related to milk production in the next lactation (123,181 cows in 808 herds).

Dry range	Milk per cow
days	lb
<39	17,632
40–49	18,334
50–59	18,463
60–69	17,871
70–79	17,310
80–89	16,474
>90	15,867

Table 3. Days dry related to the difference in milk from herdmates' production in the next lactation (expressed as the difference in lactation milk production from herdmates; 281,816 cows).

Days dry	Difference from herdmates
	lb
40	+14
50	+253
60	+315
70	+247
80	+118

DAYS OPEN

The number of days a cow is open (DO) may be the best indicator of current reproductive efficiency. A producer's goal is around 100 to 110 DO. Excessive DO costs range from $2 to $5/cow/day for each day beyond 90 days open. For example, if a cow was open 120 days, she would be open 30 excess days, a loss of $90/cow/year at $3/cow/day. Days open can be influenced by factors such as length of voluntary waiting period, heat detection accuracy, semen quality and breeding technique, nutrition, cow fertility, disease, or weather.

SERVICES PER CONCEPTION

The number of services per conception (SC) is directly related to the conception rate in a herd. Conception rate influences days open because if a cow does not conceive, she will be open an additional estrous cycle (21 days). Each .1 over 1.5 SC costs approximately $1.50. Cows with an additional .5 SC cost $7.50 more per cow. This may not be a large amount per animal, but in a herd of 1000 cows the total could come to $7500 per year. If problem breeders are not culled, SC will continue to rise. Conception rate problems may be caused by heat detection accuracy, length of voluntary waiting period, semen handling, semen quality, time of insemination, insemination techniques, reproductive tract infection, nutritional status, fertility, or weather. Table 4 shows the relationship between conception rates and services per conception.

Table 4. The relationship between conception rate and services per conception.

Conception rate	Services per conception
95–100	1.0
87–94	1.1
80–86	1.2
75–79	1.3
69–74	1.4
64–68	1.5
61–63	1.6

HEATS DETECTED

Heat detection is a constant concern in dairy herds, as poor heat detection is one of the largest contributors to a high days open value. If excessive days open cost $2 to $5 dollars per day, a single missed heat could cost $42 to $105 per cow.

DAYS IN MILK AT FIRST BREEDING

Most cows normally show their first estrus by 30–50 days after calving. Recording these early heats will assist in identifying problem breeders. Dairy producers whose herds have good conception rates should set 65–70 days in milk at first breeding as their average goal.

BREEDING INTERVAL

Breeding interval is a good indicator of how well heats are being detected after the first service. Dairy producers should strive to maintain an average breeding interval of 25–30 days. Maintaining a breeding interval in this range will reduce costs associated with excessive days open. Use the following formula to calculate the average days between breedings after the first service:

$$\text{Breeding interval} = \frac{\text{days open - DIM at first breeding}}{\text{services per cow - 1}}$$

Calculated breeding intervals are accurate only if all breeding information is reported. Table 5 demonstrates how increasing percentages of missed heats affect average breeding interval.

Table 5. The relationship between heat detection rate and average breeding interval (ABI).

ABI	Heats detected	Heats missed
days	%	%
23	90	10
26	80	20
30	70	30
35	60	40
41	50	50
50	40	60
60	30	70

CALVING INTERVAL

Calving interval (CI) is the period between two consecutive calvings. It is affected by days open and gestation length. Average CI is a good indicator of past reproductive performance because historical data is used to calculate the CI. However, calving interval may not be a good indicator of the present reproductive status of the herd. CI cannot be calculated for cows removed from the herd because there is no later calving date to use as an end point for calculations; therefore, cows removed from the herd for reasons such as failure to conceive do not contribute to the herd's average CI value. Average CI should be kept between 12 and 13 months. Table 6 shows the losses associated with CIs over 12.6 months. Table 7 shows the relationship between CI and average lactation milk yield.

Table 6. Loss of returns to management associated with CIs over 12.6 months.

CI	Loss per cow
months	dollars
12.6	0.00
13.0	0.36
13.3	14.62
13.6	32.96
14.0	57.54
14.3	88.92

Table 7. Average lactation milk yield as related to last calving interval (795 herds, 121,773 cows).

Herd average CI range	Rolling herd milk average
months	lb
11.5–11.9	15,062
12.0–12.4	17,426
12.5–12.9	18,330
13.0–13.4	18,498
13.5–13.9	17,864
14.0–14.4	17,733
14.5–14.9	17,440
15.0–15.4	15,991
15.5–15.9	15,814
16.0–16.4	14,884

AVERAGE DAYS IN MILK

Days in milk (DIM) is related closely to dry period length and is a good indicator of reproductive efficiency and herd management. The 12-month average for DIM should be 160–170 days. An average DIM greater than 200 indicates a reproductive problem as a large DIM value results in a lower lifetime milk production per cow due to long lactations and milking of late lactation cows. A short lactation reduces the lifetime milk production because of long dry periods.

SUMMARY

These variables will only be useful if accurate records are kept to determine whether a reproductive problem exists in the herd. They can also be used to pinpoint the cause of poor performance. Using records effectively will allow a dairy producer to set achievable goals for a herd.

Lack of accurate reproductive records may result in hidden costs such as fewer calves, lower conception rates, longer lactations and dry periods, poor identification of problem cows, and lost milk production.

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