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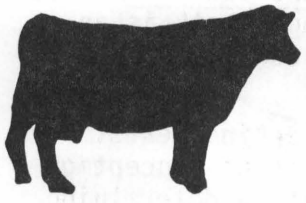

Evaluating Heat Detection

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Regularly reproducing dairy cows are critical to the success of every dairyman. The most effective measure of reproductive efficiency for a herd is average days open, the number of days between the most recent dates of calving and breeding. This guideline will help you evaluate the success of your heat detection program, an important influence of days open.

Days open for a herd reflect the reproductive strategy of the dairyman and the proficiency with which he operates his breeding program. This strategy is the plan which guides the breeding program. It includes items such as herd health programs, average number of days from calving to first breeding, method of breeding, program for keeping reproductive records, sequence of events and criteria leading to culls for reproductive reasons. Managers of herds with low days open keep excellent records and effectively follow a well-planned strategy.

Three key measures of reproductive efficiency influence days open: (1) average number of days between calving and first breeding, (2) percentage of possible heats detected (heat detection rate) after the earliest breeding, and (3) percentage of breedings resulting in pregnancy (conception rate). Each of these measurements is, in turn, influenced by other events which are more difficult to measure.

Of the three measures of reproductive efficiency, heat detection is the most prevalent problem in Virginia dairy herds; yet dairymen have no direct indication of its severity. DHI records include average days open and conception rate, but no measure of heat detection success. The tables in this guideline provide an estimate of your heat detection rate and how an improvement will affect average days open.

To illustrate use of the tables, let's consider an average Virginia herd with 125 days open and a conception rate of 50%. Routinely, 70 days elapse between calving and the first breeding date for normal cows. These are cows being bred for the first time between 60 and 81 days. From Table 2, for 70 days postpartum, we can see that the average rate of heat detection is between 43% and 53%, or about 48%. Table 2 also shows that improvement to 65% heat detection will lower days open to 110 days.

Is 48% heats detected good or bad? H. L. Barr has reported a rate of 47% for DHI herds in Ohio (J. Dairy Sci. 58:246). The following table summarizes a study by Williamson where 107 cows were watched continuously for 21 days. These studies indicate that 50% heat detection is average, but certainly not satisfactory.

Success of heat detection using various methods.

Method	Cows detected (%)
Watched 24 h/day	89
KaMaR detector	87
Herdsman (at milking)	50
Two trained dairymen (at milking)	50

Adapted from Foote, J. Dairy Sci. 58:248

For most dairymen, heat detection rates above 50% will require accurate records and observation of cows for thirty minutes twice daily under favorable conditions (dirt lots, not eating, etc.). Heat detection aids used in conjunction with twice-daily observations can increase success of detecting heats. Orange chalk is an effective aid, costs little, and prompts frequent observation of cows. The chalk must be reapplied weekly to be most effective.

From the following tables you can determine your success detecting heats. Obtain from your DHI records your herd's average days open and rate of conception (percent successful breedings). Then choose the appropriate table by determining for your herd the average number of days between calving and first breeding of normal cows.

Note from the tables that each of the following changes will reduce days open by 10 days: (1) increase by 10% the rate of heat detection, (2) increase by 10% the rate of conception, (3) reduce by 10 days the average time between calving and earliest breeding. Progress will come from concentrating on the details of keeping records, observing and breeding cows, and handling semen.

PERCENT OF HEATS DETECTED

Use the table which best fits days to first breeding in your herd. (Days postpartum)

Table 1. 60 days postpartum (average first breeding 50-70)

Avg. Days Open	Rate of Conception (%)							
	35	40	45	50	55	60	65	70
150	33	28						
140	42	37	33	29				
130	52	45	40	34	33	30		
120	63	55	51	45	40	37	35	32
110	77	68	60	54	49	45	42	39
100	93	83	73	66	60	55	51	47
90			90	82	74	68	63	58
80					93	85	80	74

Table 2. 70 days postpartum (average first breeding 60-80)

Avg. Days Open	Rate of Conception (%)							
	35	40	45	50	55	60	65	70
160	29							
150	39	33	30					
140	49	43	38	35	32	28		
130	62	53	48	43	39	34	33	31
120	75	66	58	53	48	44	40	38
110	93	82	73	65	60	55	50	47
100			90	81	73	68	63	58
90					93	86	79	73

Table 3. 80 days postpartum (average first breeding 70-90)

Avg. Days Open	Rate of Conception (%)							
	35	40	45	50	55	60	65	70
160	34	30	27					
150	45	40	35	32	28	26		
140	58	51	45	41	37	34	32	29
130	73	64	57	52	47	43	40	37
120	91	80	72	64	58	54	49	46
110			89	80	73	67	62	58
100					93	85	79	73

Table 4. 90 days postpartum (average first breeding 80-100)

Avg. Days Open	Rate of Conception (%)							
	35	40	45	50	55	60	65	70
170	29							
160	41	36	31	28				
150	54	48	42	38	35	32	29	27
140	70	62	54	49	45	41	38	35
130	89	78	70	63	57	52	48	45
120			88	80	72	66	62	57
110					93	85	78	73

In developing these tables, all cows were assumed pregnant by 200 days.

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