

Survey of DRPC'S: Comparison of Calculation of Selected Reproductive Indices with Recommendations of the American Association of Bovine Practitioners

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Introduction

A report of a committee of the American Association of Bovine Practitioners recommending methods for calculating several basic indices of reproductive performance on dairy farms was published in the Journal of Dairy Science, Vol 73, No. 1 in 1990. The goal of the committee was to help establish guidelines for uniform calculations of basic reproductive indices that might aid the dairy industry move toward one standard method of reporting reproductive performance.

A survey of all Dairy Record Processing Centers (DRPC'S) in the United States was conducted in 1991 and 1992 to determine if reproductive indices were being calculated according to the committee's published recommendations and if not, to determine any plans of each DRPC to adopt the committee's recommendations in their calculation of reproductive indices.

Acknowledgments

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References

Fetrow *et al.* 1990. Calculating Selected Reproductive Indices: Recommendations of the American Association of Bovine Practitioners. *J. Dairy Sci.* 73:78.

I. MEASURING OVERALL REPRODUCTIVE PERFORMANCE

A. PROJECTED MINIMUM AVERAGE DAYS OPEN

DAYS OPEN ON A PROJECTED BASIS SHOULD BE A PROSPECTIVE "BEST ESTIMATE" OF THE MINIMUM DAYS OPEN THAT WILL BE EXPERIENCED IN THE HERD'S FUTURE. THE AVERAGE DAYS OPEN SHOULD BE CALCULATED ACROSS THREE GROUPS OF COWS.

1. PREGNANT COWS IN THE HERD: DAYS OPEN IS THE DAYS FROM CALVING TO CONCEPTION
2. COWS WITH A BREEDING DATE, BUT NOT YET CONFIRMED PREGNANT: ASSUME COWS ARE PREGNANT AT THE LAST BREEDING AND CALCULATE AS IN #1.
3. COWS PAST VOLUNTARY WAITING PERIOD, BUT NOT YET BRED, AND COWS PREVIOUSLY BRED, BUT KNOWN TO BE OPEN: ASSUME THOSE COWS WILL BE SEEN IN ESTRUS, BRED, AND CONCEIVE 10 DAYS AFTER TEST DAY.

THIS CALCULATION WOULD BE DONE ONLY FOR COWS CURRENTLY IN THE HERD ON THE DAY OF TEST THAT ARE PAST THE VOLUNTARY WAITING PERIOD.

IT WOULD EXCLUDE TBC COWS.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC e	WISCONSIN
	ANALYTICS	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
1. CALCULATED AS SPECIFIED		X					X	
2. CALCULATED DIFFERENTLY	X		X	X	X	X		X
3. NOT AVAILABLE & NO PLANS TO DO SO								
4. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS	REPORT ACTUAL AVE DAYS OPEN		OPEN COWS NOT INCLUDED	OPEN COWS NOT INCLUDED	INCLUDES TBC COWS			

B. PAST YEARS DAYS OPEN

THE DAYS OPEN ON A PAST-YEAR BASIS SHOULD BE RETROSPECTIVE MEASUREMENT OF THE REPRODUCTIVE PERFORMANCE OF THE HERD FOR ALL CALVINGS IN THE PAST 12 PERIODS. IT SHOULD BE CALCULATED FOR ALL COWS CALVING IN THEIR SECOND OR GREATER LACTATION, BY SUBTRACTING THE PREVIOUS CALVING DATE (PC) FROM THE MOST RECENT CALVING DATE (RC) AND SUBTRACTING 280 FROM THAT DIFFERENCE.

$$\text{PAST YEAR DAYS OPEN} = (\text{RC} - \text{PC}) - 280$$

PAST YEAR DAYS OPEN SHOULD INCLUDE ALL ELIGIBLE CALVINGS IN THE PAST 12 PERIODS, EVEN IF THE COW HAS SUBSEQUENTLY BEEN CULLED. FOR BOTH PROJECTED MINIMUM AVERAGE DAYS OPEN AND PAST YEAR DAYS OPEN, RESULT SHOULD BE REPORTED AS BOTH AVERAGE AND STANDARD DEVIATION.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN	
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC	
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
1. CALCULATED AS SPECIFIED									
2. CALCULATED DIFFERENTLY	X		X					X	
3. NOT AVAILABLE & NO PLANS TO DO SO		X		X	X	X	X		
4. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS	TOTAL DAYS OPEN FOR PREG COWS/ TOTAL COWS						AVAILABLE ON DART		

C. PROJECTED CALVING INTERVAL

PROJECTED CALVING INTERVAL SHOULD BE BASED ON THE CALCULATED PROJECTED MINIMUM AVERAGE DAYS OPEN FOR COWS, PLUS A STANDARD 280-DAY GESTATION DIVIDED BY 30.4 DAYS PER AVERAGE MONTH. THE RESULT WOULD BE CALVING INTERVAL IN MONTHS.

$$\text{PROJECTED CALVING INTERVAL} = (\text{PROJECTED MINIMUM AVERAGE DAYS OPEN} + 280) / 30.4$$

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN	
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC	
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
1. CALCULATED AS SPECIFIED		X		X	X		X	X	
2. CALCULATED DIFFERENTLY	X		X			X		X	
3. NOT AVAILABLE & NO PLANS TO DO SO									
4. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS	REPORT ACTUAL AVE DAYS OPEN					USES GESTATION BY BREED			

D. PAST CALVING INTERVAL

PAST CALVING INTERVAL CONVERTS THE PAST YEAR DAYS OPEN TO A HISTORIC CALVING INTERVAL.

$$\text{PAST CALVING INTERVAL} = \text{PAST YEAR DAYS OPEN} + 280/30.4$$

FOR BOTH PROJECTED CALVING INTERVAL AND PAST CALVING INTERVAL, REPORT RESULTS AS BOTH AVERAGE AND STANDARD DEVIATION.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN	
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC	
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
1. CALCULATED AS SPECIFIED		X					X		
2. CALCULATED DIFFERENTLY	X		X	X	X	X		X	
3. NOT AVAILABLE & NO PLANS TO DO SO							X		
4. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS	SUM(CURRENT CALVING DATE - PRIOR CALVING DATE) / #COWS			USE PRIOR FRESH DATE TO CURRENT FRESH DATE	USE AVERAGE CURRENT CALVING DATE - PREVIOUS CALVING DATE	USES GESTATION DAYS BY BREED		AVAILABLE ON DART	

II. MEASURING ESTRUS DETECTION INTENSITY

(PERCENT OF POSSIBLE HEATS DETECTED)

PERCENT OF POSSIBLE HEATS DETECTED PROVIDED AN ESTIMATE OF THE INTENSITY OF ESTRUS DETECTION.

IT DOES NOT MEASURE THE ACCURACY OF DETECTION.

A. CURRENT MONTH:

NUMERATOR (N): ALL BREEDINGS AND REPORTED HEATS IN ELIBLE COWS IN THE PERIOD.

DEMONINATOR (D): ESTRUS DAYS IN THE PERIOD IN ELIGIBLE COWS.

$$\text{PERCENT OF POSSIBLE HEATS DETECTED} = (N/[D/21]) \times 100$$

ELIGIBLE COWS: ALL COWS PAST VWP CONTRIBUTING ESTRUS CYCLE DAYS IN PERIOD INCLUDES:

1. UNBRED AND KNOWN OPEN COWS; DAYS PAST VWP IN THE PERIOD.
2. BRED COWS NOT KNOWN TO BE PREGNANT; DAYS IN THE PERIOD UP TO THE LAST BREEDING + (DAYS IN PERIOD AFTER LAST BREEDING X [1 - CR]), WHERE CONCEPTION RATE (CR) WOULD BE: 1/SERVICES PER PREGNANCY, ALL COWS; USING THE VALUE FOR THE CURRENT MONTH.
3. PREGNANT COWS: DAYS IN THE PERIOD UP TO THE LAST BREEDING DATE (THIS WOULD RARELY OCCUR).
4. TO-BE-CULLED COWS: DAYS IN THE PERIOD UP TO DATE REPORTED AS TO TBC, UNLESS COW HAS BEEN REPORTED PREGNANT, IN WHICH CASE SHE IS HANDLED AS A PREGNANT COW.
5. COWS TURNED WITH BULL: DAYS PAST VWP IN PERIOD UP TO TWB DATE, UNLESS SHE IS HANDLED AS A PREGNANT COW.
6. USE OF PROSTAGLANDIN (PGF): EACH USE OF PGF IN AN ELIGIBLE COW WUOULD ADD 7 DAYS TO ESTRUS DAYS IN THE PERIOD.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH
							MADISON

1. CALCULATED AS SPECIFIED							X	
2. CALCULATED DIFFERENTLY				X				X
3. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X		X	X		
4. NOT AVAILABLE & PLAN TO PROVIDE				X				
COMMENTS		USE BAR'S FORMULA FOR PREG COWS			LIST # HEATS OBSERVED & EXPECTED			

B. PAST YEAR

THIS CAN BE DONE BY CALCULATING THE NUMERATOR AND DEMONINATOR FOR EACH PERIOD AND THAN SUMMING THOSE NUMERATORS AND DENOMINATORS AND THEN SUMMING THOSE NUMERATORS AND DEMONINATORS AND USING THE SAME FORMULA AS FOR THE CURRENT MONTH.

THE ESTRUS DAYS IN EACH PERIOD WOULD BE CALCULATED IN THE SAME WAY AS FOR THE CURRENT MONTH, EXCEPT THAT BRED COWS SHOULD BE HANDLED BASED ON KNOWN FINAL OUTCOME OF ANY BREEDING, EVEN IF THAT OUTCOME WOULD HAVE BEEN UNKNOWN DURING THE PERIOD. THUS, IF A COW WERE BRED DURING PERIOD 1 AND A PREGNANCY TO THAT BREEDING WERE CONFIRMED IN PERIOD 3, THEN THE COW SHOULD BE TREATED AS A PREGNANT COW IN PERIOD 1. SIMILARLY, IF THE BREEDING IN PERIOD 1 HAD LATER BEEN SHOWN TO HAVE BEEN UNSUCCESSFUL, THEN THE COW SHOULD BE TREATED AS AN OPEN, UNBRED COW IN PERIOD 1.

THE PAST YEAR PARAMETER CANNOT BE CALCULATED BY SIMPLY ACCUMULATING THE RAW NUMERATOR AND DENOMINATOR EACH PERIOD WHILE CALCULATING THE CURRENT MONTH VALUES, SINCE IT WOULD TEND TO UNDERESTIMATE THE ESTRUS DAYS CONTRIBUTED BY COWS BRED, BUT NOT CONFIRMED PREGNANT AND WOULD NOT ADJUST FOR CORRECTIONS MADE IN THE IN THE DATA DURING THE YEAR. THE CALCULATION SHOULD BE NEWLY MADE, USING RAW DATA FOR EACH TEST PERIOD TO CREATE THE SUMMARY FOR THE YEAR.

DATA FROM CULLED COWS AND TBC COWS SHOULD BE INCLUDED IN THE CALCULATIONS, PROVIDED THEY WERE PART OF THE ELIGIBLE COWS IN THE HERD AT ANY TIME DURING THE 12 PERIODS.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH
							MADISON

1. CALCULATED AS SPECIFIED						X	X	
2. CALCULATED DIFFERENTLY				X				X
3. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X		X			
4. NOT AVAILABLE & PLAN TO PROVIDE				X				
COMMENTS		USE BAR'S FORMULA FOR PREG COWS						

III. MEASURING CONCEPTION EFFICIENCY

A. SERVICES PER PREGNANCY, ALL COWS

IS A MEASURE OF THE CONCEPTION RATE FOR BREEDINGS IN THE HERD AS A WHOLE.

1. CURRENT MONTH

DETERMINE THE OUTCOME FOR ALL AI BREEDINGS (B1) IN THE TEST PERIOD 2 PERIODS AGO (NUMERATOR). THOSE BREEDINGS THAT RESULTED IN A CONFIRMED PREGNANCY MAKE UP THE DEMONINATOR (P1). PREGNANCY CAN BE DESIGNED EITHER BY VETERINARY EXAMINATION OR BY 65 DAY NONRETURN, DEPENDING ON THE HERD'S POLICY. CONFIRMATION BY EXAMINATION IS PREFERRED.

SERVICES PER PREGNACY, ALL COWS = B1 / P1

ALL COWS IN THE HERD ARE ELIGIBLE FOR INCLUSION IN THIS CALCULATION, EVEN TBC COWS.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON
a. CALCULATED AS SPECIFIED				X				
b. CALCULATED DIFFERENTLY		X			X			X
c. NOT AVAILABLE & NO PLANS TO DO SO	X		X			X	X	
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS					LIST # PREG & # BREEDINGS		AVAILABLE ON DART	

2. PAST YEAR

DETERMINE THE OUTCOME FOR ALL AI BREEDINGS (B2) IN THE TEST PERIODS FROM 2 PERIODS AGO BACK TO THE TEST PERIOD 14 PERIODS AGO (FOR A TOTAL OF 12 PERIODS). THOSE BREEDINGS THAT RESULTED IN A CONFIRMED PREGNANCY MAKE UP THE DENOMINATOR (P2).

SERVICE PER PREGNANCY, ALL COWS = B2 / P2

IDEALLY, THE COWS CONSIDERED SHOULD INCLUDE ALL COWS IN THE HERD THAT WERE BRED DURING THE 2 TO 14 RETROSPECTIVE TEST PERIOD INTERVALS, INCLUDING COWS THAT WERE SUBSEQUENTLY CULLED. IF THIS IS NOT POSSIBLE, THEN AT LEAST ALL COWS CURRENTLY IN THE HERD SHOULD BE INCLUDED, EVEN TBC COWS.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON
a. CALCULATED AS SPECIFIED			X				X	X
b. CALCULATED DIFFERENTLY		X			X	X		X
c. NOT AVAILABLE & NO PLANS TO DO SO	X							
d. NOT AVAILABLE & PLAN TO PROVIDE				X				
COMMENTS						DOES NOT INCLUDE CULLED COWS		

B. SERVICES PER PREGNANCY, PREGNANT COWS

IS A MEASURE OF THE OVERALL CONCEPTION RATE WHEN FERTILE COWS ARE BRED.

1. CURRENT MONTH

FOR ALL COWS DESIGNATED PREGNANT THE PERIOD (P3), SUM THE AI BREEDINGS USED ON THOSE COWS (B3). A DESIGNATION OF PREGNANCY CAN BE BY VETERINARY EXAMINATION OR 65-DAY NONRETURN, DEPENDING ON THE HERD'S POLICY.

SERVICES PER PREGNANCY, PREGNANT COW = B3 / P3

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON
a. CALCULATED AS SPECIFIED				X				
b. CALCULATED DIFFERENTLY								X
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X		X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS							AVAILABLE ON DART	

2. PAST YEAR

FOR ALL COWS DESIGNATED PREGNANT IN THE PAST 12 TEST PERIODS (P4), SUM THE BREEDINGS USED ON THOSE COWS PRIOR TO PREGNANCY DESIGNATION (B4).

SERVICES PER PREGNANCY, PREGNANT COWS = B4 / P4

COWS CONFIRMED PREGNANT TO A BREEDING DATE AFTER BEING TURNED WITH THE BULL (TWB) WOULD NOT CONTRIBUTE TO THESE CALCULATIONS. IDEALLY, THE COWS CONSIDERED SHOULD INCLUDE ALL COWS IN THE HERD THAT WERE PREGNANT TO AN AI BREEDING IN THE LAST 12 PERIODS, INCLUDING COWS THAT WERE SUBSEQUENTLY CULLED. IF THIS IS NOT POSSIBLE, THEN AT LEAST ALL COWS CURRENTLY IN THE HERD SHOULD BE INCLUDED, EVEN TBC COWS.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH
a. CALCULATED AS SPECIFIED		X	X				X	X
b. CALCULATED DIFFERENTLY	X				X			X
c. NOT AVAILABLE & NO PLANS TO DO SO						X		
d. NOT AVAILABLE & PLAN TO PROVIDE			X					
COMMENTS	INCLUDES NATURAL & AI SERVICES							

C. SERVICE-SPECIFIC CONCEPTION RATES

PROVIDE A MEASURE OF CONCEPTION EFFICIENCY BROKEN DOWN BY THE NUMBER OF SERVICES A COW HAS RECEIVED.

1. CURRENT MONTH (USING FIRST SERVICE CONCEPTION RATE AS AN EXAMPLE)

DETERMINE THE OUTCOME OF ALL FIRST SERVICES (B5) IN THE TEST PERIOD 2 PERIODS AGO FOR COWS STILL PRESENT IN THE HERD. THOSE BREEDINGS THAT RESULTED IN A PREGNANCY MAKE UP THE NUMERATOR (P5). PREGNANCY CAN BE DESIGNATED EITHER BY VETERINARY EXAMINATION OR BY 65-DAY NONRETURN, DEPENDING ON THE HERD'S POLICY.

FIRST SERVICE CONCEPTION RATE (%) = P5 / B5 X 100

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH
a. CALCULATED AS SPECIFIED		X		X			X	
b. CALCULATED DIFFERENTLY								X
c. NOT AVAILABLE & NO PLANS TO DO SO	X		X		X	X		X
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS							AVAILABLE ON DART	

2. PAST YEAR

DETERMINE THE OUTCOME OF ALL FIRST SERVICES (B6) IN THE TEST PERIODS FROM 2 PERIODS AGO BACK TO THE TEST PERIOD 14 PERIODS AGO (FOR A TOTAL OF 12 PERIODS). THOSE BREEDINGS THAT RESULTED IN A PREGNANCY MAKE UP THE NUMERATOR (P6).

FIRST SERVICE CONCEPTION RATE (%) = P6 / B6 X 100

IDEALLY, THE COWS CONSIDERED SHOULD INCLUDE ALL COWS IN THE HERD THAT WERE BRED DURING THE 2 TO 14 RETROSPECTIVE TEST PERIOD INTERVALS, INCLUDING COWS THAT WERE SUBSEQUENTLY CULLED. IF THIS IS NOT POSSIBLE, THEN AT LEAST ALL COWS CURRENTLY IN THE HERD SHOULD BE INCLUDED, EVEN TBC COWS. IN ADDITION TO FIRST SERVICE CONCEPTION RATE, SIMILAR CALCULATIONS SHOULD BE MADE FOR CONCEPTIONS ON SECOND, THIRD, AND GREATER THAN THIRD SERVICES.

	AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH
a. CALCULATED AS SPECIFIED		X					X	X
b. CALCULATED DIFFERENTLY			X			X		X
c. NOT AVAILABLE & NO PLANS TO DO SO	X				X			
d. NOT AVAILABLE & PLAN TO PROVIDE				X				
COMMENTS								

IV. LOSS OF CONFIRMED PREGNANCIES

A. ABORTIONS PER KNOWN PREGNANCY (%)

ESTIMATES FETAL LOSS AFTER PREGNANCY HAS BEEN CONFIRMED BY VETERINARY EXAMINATION. IN EFFECT, IT IS AN ANSWER TO THE DAIRYMAN'S QUESTION: ONCE A COW IS CONFIRMED PREGNANT, WHAT IS THE CHANCE SHE WILL ABORT?

ABORTIONS PER KNOWN PREGNANCY CAN ONLY BE CALCULATED IN HERDS THAT CONFIRM PREGNANCY BY VETERINARY PALPATION. THERE ARE TWO EVENTS THAT SHOULD BE RECOGNIZED AS ABORTIONS:

1. VISIBLE ABORTION (SEEN BY DAIRYMAN)
2. COWS CONFIRMED OPEN ON EXAMINATION AFTER PREVIOUSLY BEING CONFIRMED PREGNANT ON EXAMINATION. THIS CRITERIA CANNOT BE USED IN HERDS THAT ESTABLISH PREGNANCY BY 65-DAY NONRETURN TO ESTRUS.

1. CURRENT MONTH

COWS ELIGIBLE FOR THIS CALCULATION WOULD INCLUDE ALL ADULT PREGNANT COWS. NULLIPARIOUS PREGNANT HEIFERS WOULD BE EXCLUDED.

NUMERATOR: NUMBER OF ABORTIONS BY ABOVE DEFINITIONS (A)

DENOMINATOR: (NUMBER OF PREGNANT COWS AT THE END OF THE LAST PERIOD [PL] + NUMBER OF PREGNANT COWS AT THE END OF THIS PERIOD [PT]) / 2.

PERCENT ABORTIONS PER KNOWN PREGNANCY FOR THE CURRENT MONTH SHOULD BE REPORTED BOTH AS THE ABSOLUTE NUMBER OF ABORTIONS (A), AND AS:

$$\text{ABORTIONS PER KNOWN PREGNANCY (\%)} = \left(\left[\frac{A}{(PL + PT) / 2} \right] \times 7.5 \right) \times 100$$

THE RATIO OF A / ((PL + PT) / 2) IS THE LOSS OF KNOWN PREGNANCIES PER PREGNANT COW PER MONTH. ASSUMING THAT THE AVERAGE

COW IS CONFIRMED PREGNANT AT 50 DAYS OF GESTATION, THEN THE AVERAGE PREGNANCY IS "KNOWN" FOR APPROXIMATELY 7.5 MONTHS.

THE RISK THAT A COW WILL ABORT DURING THE TIME SHE IS CONFIRMED PREGNANT IS THUS APPROXIMATELY THE LOSS PER MONTH MULTIPLIED

TIMES 7.5 MONTHS. ABORTIONS PER KNOWN PREGNANCY IS A MEASURE OF THE RISK OF FETAL LOSS ONCE A PREGNANCY HAD BEEN CONFIRMED.

IF A HERD CONFIRMS PREGNANCIES AT A TIME SUBSTANTIALLY DIFFERENT THAN 50 DAYS, THE THE 7.5 COULD BE ADJUSTED TO REFLECT THIS DIFFERENCE.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN	
ANALYTICS	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC	
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON

a. CALCULATED AS SPECIFIED								X	
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X		X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS									

2. PAST YEAR

NUMERATOR: SUM OF ABORTIONS IN THE LAST 12 PERIODS (SA) DIVIDED BY 12

DENOMINATOR: AVERAGE OF THE NUMBER OF PREGNANT COWS (AP) ON EACH TEST DAY FOR THE LAST 12 PERIODS.

$$\text{ABORTIONS PER KNOWN PREGNANCY (\%)} = \left(\left[\frac{SA}{12} \right] / AP \right) \times 7.5 \times 100$$

IF AN ABORTION OCCURS PRIOR TO DAY 150 OF PREGNANCY, IT SHOULD BE CONSIDERED AS A RETURN TO OPEN STATUS. NO NEW

LACTATION WOULD BEGIN. THE BREEDINGS AND THE PREGNANCY THAT RESULTED IN THE ABORTION SHOULD BE RETAINED FOR THE

CALCULATION OF OTHER REPRODUCTIVE INDICES.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN	
ANALYTICS	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC	
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON

a. CALCULATED AS SPECIFIED								X	
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X		X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS									

V. COWS LEAVING THE HERD DUE TO REPRODUCTIVE FAILURE

REPRODUCTIVE CULLING RATE IS A MEASURE OF COWS EXITING FROM THE HERD DUE TO UNACCEPTABLE REPRODUCTIVE PERFORMANCE.

A. REPRODUCTIVE CULLING RATE (%)

FOR EACH COW THAT LEAVES THE HERD, THE DAIRYMAN SHOULD REPORT THE REASON FOR THE COW'S EXIT. BOTH THE NUMBER OF COWS CULLED OVER THE PAST 12 PERIODS FOR REPRODUCTION (NR) AND THE PERCENT OF THE HERD SHOULD BE REPORTED. THE PERCENT OF THE HERD SHOULD BE CALCULATED USING THE NUMBER CULLED (NR) AS THE NUMERATOR AND THE AVERAGE HERD INVENTORY (I) AS THE DENOMINATOR. THE AVERAGE INVENTORY IS CALCULATED BY AVERAGING THE TOTAL NUMBER OF COWS, BOTH MILKING AND DRY, ON EACH TEST DAY FOR THE PAST 12 PERIODS. BOTH THE NUMBER OF COWS CULLED FOR REPRODUCTION (NR) AND THE PERCENT OF THE HERD CULLED SHOULD BE REPORTED. BECAUSE THE MONTH OF CULLING DOES NOT USUALLY CORRESPOND TO THE MONTH OF REPRODUCTIVE EVENT THAT CAUSED THE CULLING, THIS PARAMETER SHOULD BE CALCULATED ONLY ON A PAST YEAR BASIS, NOT FOR THE CURRENT MONTH'S CULLS.

$$\text{REPRODUCTIVE CULLING RATE (\%)} = (\text{NR} / \text{I}) \times 100$$

	AGRI-TECH		MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
a. CALCULATED AS SPECIFIED		X							
b. CALCULATED DIFFERENTLY	X								
c. NOT AVAILABLE & NO PLANS TO DO SO			X		X	X	X	X	
d. NOT AVAILABLE & PLAN TO PROVIDE				X					X
COMMENTS	REPORT #	REASON FOR						AVAILABLE	
	SOLD FOR	CULLING RARELY						ON DART	
	REPRO FAILURE	REPORTED							

VI. MEASURING THE EFFICIENCY OF BULL BREEDING PROGRAM

MEASURES OF REPRODUCTIVE PERFORMANCE ARE ALSO NEEDED FOR HERDS WHERE NATURAL SERVICE BY BULLS PLAYS AN IMPORTANT ROLE IN THE OVERALL REPRODUCTIVE PROGRAM

A. PERCENT COWS PREGNANT BY THE BULL

1. CURRENT MONTH

NUMERATOR: PREGNANCIES CONFIRMED IN THE PERIOD THAT WERE THE RESULT OF A BULL BREEDING (BP). THIS REQUIRES THAT THE HERD REPORT ESTIMATES OF THE DATE OF PREGNANCY IN COWS THAT HAVE BEEN BRED BY A BULL, SO THAT PREGNANCIES FROM THE BULL CAN BE DISTINGUISHED FROM PREGNANCIES FROM PREVIOUS AI BREEDINGS.

DENOMINATOR: ALL PREGNANCIES REPORTED IN THE PERIOD (TP).

$$\text{PERCENT PREGNANT BY THE BULL} = \text{BP} / \text{TP} \times 100$$

	AGRI-TECH		MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
a. CALCULATED AS SPECIFIED									
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS	DO NOT								
	SEPERATE AI								
	& NATURAL								
	SERVICE								

2. PAST YEAR

SAMES AS CURRENT MONTH CALCULATION, EXCEPT THAT PREGNANCIES REPORTED IN THE PAST 12 TEST PERIODS WOULD MAKE UP THE CALCULATION GROUP

	AGRI-TECH		MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
a. CALCULATED AS SPECIFIED									
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS	DO NOT SEPERATE AI & NATURAL SERVICE								

B. AVERAGE DAYS OPEN WITH THE BULL

1. CURRENT MONTH

FOR EACH COW CONFIRMED PREGNANT TO A BULL BREEDING IN THE PERIOD, CALCULATE THE NUMBER OF DAYS BETWEEN THE TURNED WITH BULL DATE (TWB) AND THE ESTIMATED DATE OF CONCEPTION TO BULL BREEDING. THIS REQUIRES THAT THE HERD REPORT ESTIMATES THE DATE OF CONCEPTION IN COWS WITH BULL BREEDINGS. CALCULATE THE AVERAGE OF THESE DAYS FROM TWB DATE TO CONCEPTION FOR ALL COWS CONFIRMED PREGNANT DURING THE PERIOD TO A BULL BREEDING.

	AGRI-TECH		MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
a. CALCULATED AS SPECIFIED									
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS									

2. PAST YEAR

SAME CALCULATIONS FOR THE PAST 12 MONTHS, WITH ALL COWS CONFIRMED PREGNANT TO A BULL IN EACH PERIOD MAKING UP THE GROUP FOR CALCULATION.

	AGRI-TECH		MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
	ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
	TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	RALEIGH	MADISON
a. CALCULATED AS SPECIFIED									
b. CALCULATED DIFFERENTLY									
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE									
COMMENTS									

C. AVERAGE DAYS IN MILK WHEN TURNED WITH THE BULL

FOR ALL TWB COWS NOT CONFIRMED PREGNANT TO AN AI BREEDING, CALCULATE AVERAGE DAYS IN MILK AT TWB DATE. THIS CAN BE CALCULATED ON BOTH A CURRENT MONTH AND A PAST YEAR.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON

a. CALCULATED AS SPECIFIED								
b. CALCULATED DIFFERENTLY								
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS								

D. CONCEPTION RATE FOR COWS TURNED WITH BULL

FOR PREGNANT TWB COWS CONFIRMED PREGNANT TO A BULL BREEDING, CALCULATE:

$$\text{BULL SERVICES PER PREGNANCY} = \text{AVERAGE OF: (CONCEPTION DATE - [TWB DATE + 10]) / 21}$$

$$\text{BULL CONCEPTION RATE} = 1 / \text{BULL SERVICES PER PREGNANCY}$$

THIS CAN BE CALCULATED ON BOTH A CURRENT MONTH AND A PAST YEAR BASIS.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON

a. CALCULATED AS SPECIFIED								
b. CALCULATED DIFFERENTLY								
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS								

E. BULL USAGE RATE

1. CURRENT MONTH

TWB COWS THAT ARE NOT CONFIRMED PREGNANT DIVIDED BY NUMBER OF BULLS WITH ACCESS TO SUCH COWS.

AGRI-TECH	MICHIGAN	MID-STATES	MINNESOTA	NORTHEAST	PENN DHIA	DRPC @	WISCONSIN
ANALYTICS	DHI COMPUTING	DHIA	DRPC	DRPL	SERVICE CENTER	RALEIGH	DHIC
TULARE	PROVO	LANCING	AMES	ST. PAUL	ITHACA	UNIV. PARK	MADISON

a. CALCULATED AS SPECIFIED								
b. CALCULATED DIFFERENTLY								
c. NOT AVAILABLE & NO PLANS TO DO SO	X	X	X	X	X	X	X	X
d. NOT AVAILABLE & PLAN TO PROVIDE								
COMMENTS								