

Repeat Breeders — A Survey and Study of Cows Upon Fourth Insemination

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Summary

Four hundred cows were examined clinically one day after their fourth insemination. The various diagnoses made at the time of clinical examination were: management errors (5%); anatomical defects (19%); abnormal vaginal discharge (16%); cystic follicles (10%); delayed ovulation (2%), and clinically normal (48%). The pregnancy rate of the clinically normal cows after fourth insemination was 60%. Clinically normal cows were not treated following fourth insemination.

Only four of 25 endometrial biopsy specimens taken from cows with abnormal vaginal discharges were positive on bacteriological examination, yielding three pure cultures of *C. pyogenes* and one mixed infection of streptococcus and staphylococcus sp. Fourteen cows from the clinically normal group and 18 other clinically normal cows were purchased for additional evaluation after five to seven infertile inseminations. Delayed ovulation occurred only twice in 116 estrous cycles observed, and the two cows with delayed ovulations had normal ovulations on subsequent estrous cycles. Of the 32 purchased cows, 14 (44%) did not become pregnant. In 10 of these cows, structural defects which could have prevented conception were found at the time of slaughter.

Introduction

For quite a number of years the 60-90 day non-return rate of many artificial insemination (A.I.) organizations has been around 68%. Attempts to raise this percentage significantly have not been successful. Even a carefully conducted reproductive herd health program did not markedly improve first service conception rates (3). Because many cows repeatedly return to estrus, it was deemed important to subject a group of subfertile cows to careful clinical evaluation when they were submitted for the fourth insemination.

Materials and Methods

Four hundred Friesian cows in the A.I. organization "Combinatie Utrecht" were examined upon presentation for the fourth insemination, between June 1, 1973, and March 1, 1974. As a rule, first

clinical evaluations and anamnesis occurred on the day after insemination. Included in the history were age of cow, course of previous parturition and post-partum period, the insemination record of current and preceding years, sire selection, duration of the estrous cycle, time of insemination, and duration and intensity of estrus. The clinical evaluation consisted of an assessment of general health of the animal, followed by rectal and vaginoscopic examinations of the genital tract. Based on the findings, the cows were assigned to one of five groups (Table 1). An endometrial biopsy specimen was taken from a number of the cows with abnormal cervical mucus for bacteriological and histological examination by the method of de Bois (2).

Approximately four months later, all cows were re-examined for pregnancy and fourteen which failed to become pregnant were purchased for further evaluation in the Clinic of Veterinary Obstetrics, Gynaecology and A.I.

Results

The clinical classification of cows and results of inseminations are presented (Table 1). Of the 400 cows, 335 were first examined during the pasture and 65 during the stabling seasons. The pregnancy rates after the fourth and fifth inseminations were 40% and 27% respectively of the cows bred at these times. A total of 263 (65.8%) of the 400 cows became pregnant.

Endometrial biopsies were taken randomly from 25/63 cows in the group with abnormal vaginal discharges. Only four biopsies were positive on bacteriological examination, yielding *C. pyogenes* in three cases and mixed cultures of staphylococcus and streptococcus species in one case. Histological evaluation resulted in eight positive, three weakly positive and one questionable biopsy.

In addition to the 14 cows of the clinically normal group, 18 other clinically normal cows were purchased to increase numbers. Bacteriological examination of a biopsy specimen taken during the first estrus after arrival at the clinic was negative in all 32 cows. Histological evaluation of the same biopsy specimens was negative in 25, questionable in five and weakly positive in two cows. A total of 126 estrous cycles were studied in the purchased animals. The length of the cycle was normal in 31/32 cows (17-24 days). The duration and intensity of estrus was also normal in the majority of estrous cycles. The duration of estrus

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was too long (30 hrs.) in one and too short (six hrs.) in two animals. Estrus was not detected in 10/126 (8%) cycles studied. Delayed ovulation occurred only twice in 116 estrous cycles. Two cows were involved; one ovulated 24 and the other 48 hrs. after the end of estrus. Both cows ovulated at the normal time (8 and 12 hrs. respectively) after the subsequent estrus without treatment. One conceived and the other had structural defects at the time of post-mortem examination (slaughter).

All purchased cows were inseminated on the second estrus after arrival at the clinic, which resulted in pregnancy in 7/32 (22%). The 25 cows which failed to conceive to this insemination were bred by natural service, which led to pregnancy in 8/25 (32%). The remaining 17 animals were bred naturally a second time; two conceived. Those which did not conceive to this service were given a six-week period of sexual rest after which they were served again, which led to one conception. The remaining 14 animals (44%) which did not become pregnant were slaughtered and examined.

Structural defects were found in 10/14 cows. Four had bilateral aberrations of the oviduct and/or bursa and five had unilateral abnormalities (four on the right and one on the left). Stenosis of the cervix was found in one heifer.

Discussion

A primary goal of this study was to make an inventory of the abnormalities found in repeat breeder cows. It is clear from the results that management errors account for a small percentage of the cases (5%). A much larger group was that of cows with anatomical defects of the genital tract (19%). Congenital defects were of little importance. Since all animals with a double cervical os conceived readily, this abnormality does not greatly influence fertility. The prognosis became much less favorable in cases of segmental aplasia, particularly in heifers. It was impossible to pass a pipette through the cervix of a few heifers; the latter might also be considered as a form of segmental aplasia.

The majority of anatomical defects were acquired.

Table 1
Clinical Diagnosis, Breeding History and Culling in 400 Cows Presented for Fourth Insemination

Clinical diagnosis	Total No. (%)	Pregnant after insemination:			Non-pregnant-culled after insemination					
		4	5	6 7&8	4	5	6	7	8	9
MANAGEMENT ERROR										
Pregnant before fourth breeding	3	-	-	-	-	-	-	-	-	-
Not in estrus	2	-	1	-	1	-	-	-	-	-
Inseminated too early	5	2	1	1	1	-	-	-	-	-
Inseminated too late	12	2	5	2	1	2	-	-	-	-
Totals	22(5)	4	7	3	3	2	-	-	-	-
ANATOMICAL DEFECTS										
Double cervical os	6	5	1	-	-	-	-	-	-	-
Segmental aplasia	4	-	-	-	2	2	-	-	-	-
Adhesions after Caesarean section	7	2	1	-	2	2	-	-	-	-
Defects of ovarian bursa, oviduct, uterus and/or cervix	37	4	1	2	13	11	5	1	-	-
Uro- or pneumovagina	19	3	1	1	10	2	-	2	-	-
Other	3	-	-	-	-	1	2	-	-	-
Totals	76(19)	14	4	3	27	18	7	3	-	-
ABNORMAL VAGINAL DISCHARGE										
Cloudy mucus*	12	6	2	2	1	1	-	-	-	-
Flecks of pus	22	8	4	1	2	3	3	1	-	-
Mucopurulent	10	5	2	-	2	-	-	-	-	1
Purulent	16	3	2	2	3	5	-	1	-	-
Dark brown, watery, foul odor	2	-	-	-	2	-	-	-	-	-
Unknown	1	-	1	-	-	-	-	-	-	-
Totals	63(16)	22	11	5	10	9	3	2	-	1
OVULATORY DISTURBANCES										
Cystic follicles**	41	6	7	9	6	8	3	2	-	-
Delayed ovulation***	7	-	5	1	-	-	-	-	-	1
Totals	48(12)	6	12	10	6	8	3	2	-	1
CLINICALLY NORMAL										
(%)	191(48)	114 (60)	30 (16)	15 (8)	6	15	6	4	1	-
TOTALS (%)	400(100)	160 (40)	64 (16)	36 (9)	52	52	19	11	1	2

*Does not include cows with follicular cysts and cloudy mucus.

**Treated with 3,000 units HCG - 125 mg progesterone (Rx Nymfalon, Intervet Bv., Boxmeer, Holland).

***Later than 20 hours after the end of heat.

In these cases the prognosis is unfavorable as only a few animals in this category became pregnant. The fertility of cows with a cloudy mucus discharge was not decreased; therefore, cloudy mucus is probably not abnormal. For 48 cows with flecks of pus, purulent or mucopurulent discharges, fertility was depressed. It was deemed important to determine causes of abnormal discharges, but attempts to determine these were mostly unsuccessful. Only 4/25 animals were positive on bacteriological examination of biopsy specimens. These findings support the opinion of de Bois (2) that bacterial infections play a minor role in repeat breeder cows. Furthermore, none of the 32 clinically normal purchased cows were positive on bacteriological examination. It may also be concluded that bacteriological examination of endometrial biopsy specimens of repeat breeder cows is only of limited value, even in those which have an abnormal discharge.

The greatest majority of cows with ovulatory disturbances had cystic follicles. As treatment was not always successful in these cows, prognosis for fertility is questionable.

Delayed ovulation was encountered in seven cows of which four ovulated upon palpation of the ovary. All seven animals were re-inseminated during the same estrus, but none conceived. Later 6/7 became pregnant without treatment. Ovulation did occur at normal time in these cows. The time of ovulation was carefully checked in purchased cows as well. Delayed ovulation occurred in only 2/116 estrous cycles observed. Both ovulated at the normal time during the subsequent cycle. These results indicate that delayed ovulation occurs only rarely in the Friesian breed. Furthermore, delayed ovulations can probably be attributed to coincidental factors which do not necessarily play a role at the subsequent estrus. Therefore, treatment is not indicated in these animals.

The group of clinically normal cows was an interesting one. As is evident from the results, 60% conceived on fourth insemination which is the same as the first service conception rate of all artificially inseminated cows from which the samples were taken. It is important to understand why these animals failed to conceive to any of the previous inseminations. The most important reason might be the occurrence of early embryonic death. Bishop (1) believes that each fertilization must be regarded as a genetic experiment and that a number of the experiments are doomed to failure. Should failure occur sequentially in the same cow, she becomes a repeat breeder but she has the same chance, however, that the genetic experiment will be successful at the next insemination. In addition to early embryonic death, other factors also play a role. During the study it became apparent that some anatomical defects are very difficult to diagnose clinically; frequently they are detectable only upon post-mortem examination. This factor must be kept in mind for cows which appear to be clinically normal. The percentage of older repeat breeder cows in these samples was higher than that of all cows at first service. Likewise the percentage of cows which had an abnormal parturition and/or postpartum period was higher. Sixteen percent experienced an abnormal parturition and 21% an abnormal postpartum period. De Kruif (3) reported that older cows and cows with an abnormal parturition are less fertile. The average interval between parturition and first service was 86 days for the repeat breeder group and 89.8 days for all cows at first service ($P > 0.05$).

References

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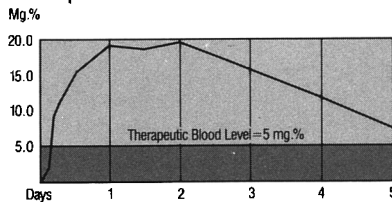
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