BRIEF COMMUNICATION

SYNCHRONIZATION OF OESTRUS IN DAIRY
HEIFERS WITH 6 α -METHYL-17 α -ACETOXY-
PROGESTERONE AND ITS EFFECT ON
CONCEPTION RATE*

M. L. FAHNING,[†] R. H. SCHULTZ,[†] E. F. GRAHAM,
J. D. DONKER AND H. W. MOHRENWEISER

*Department of Dairy Husbandry, University of Minnesota,
St. Paul, Minnesota, U.S.A.*

(Received 22nd February 1966)

Since the introduction of 6 α -methyl-17 α -acetoxyprogesterone (MAP or medroxyprogesterone acetate) many trials and research projects have been conducted using this orally active progestin. Considerable variation in conception rate following synchronization of oestrus with this compound has been reported (Hansel, 1965; Zimbelman, 1965). The objective of the current study was to evaluate the effect of a specific dosage of MAP (Repromix^R, The Upjohn Company, Michigan) on fertility when administered under specifically controlled conditions.

Forty Holstein heifers, 15 to 18 months of age, were used in this study. These animals, as part of another experiment, were being fed two different types of hay (Hay types A and B) with twenty animals assigned to each group. Ten animals were selected from each group to be recycled while the remaining ten animals from each served as controls. All animals were examined by rectal palpation to ensure that the reproductive organs were normal. During the month before the time of MAP administration the animals were turned outside and closely observed for 1 hr three times a day for detection of oestrus.

The heifers ranged in weight from 630 to 825 lb (average 717 lb). Therefore, the MAP was fed on a body weight basis utilizing 0.4 mg/lb b.w./day based on the work reported by Hansel (1965). The daily dosage of MAP for each animal was weighed and mixed with $\frac{1}{2}$ lb of ground concentrate mixture. The MAP-grain mixture was fed individually to the animals at noon each day. The animals were started on the MAP treatment on Day 14 of the oestrous cycle and remained on treatment for a minimum of 11 days and a maximum of 18 days (mean 14.8 days).

The variability in length of treatment was due to the fact that all animals were started on the MAP-grain mixture on Day 14 of their respective oestrous

* Scientific Journal Series Paper No. 5886, Minnesota Agricultural Experiment Station.

[†] Present address: Department of Veterinary Obstetrics and Gynecology, College of Veterinary Medicine, University of Minnesota, St. Paul.

cycles and, in order to synchronize the subsequent oestrus, the treatment was withdrawn from all animals on the same date. Since the normal oestrous cycle is considered to be 18 to 24 days, the minimum treatment period of 11 days was used to carry the animals beyond the normal oestrous cycle range, so the subsequent oestrus would be truly synchronized. Beginning in the afternoon of the first day following MAP withdrawal, the treated animals were inseminated every 12 hr until ovulation occurred as determined by rectal palpation. The control animals were inseminated three times at 12-hr intervals beginning at the onset of oestrus. The 12-hour interval between inseminations in both the experimental and control groups was utilized to aid in eliminating variability of conception rates due to the timing of insemination. All animals were bred by artificial insemination using semen from bulls of known high fertility.

TABLE 1

	<i>No. animals</i>	<i>Conceived to first service</i>	<i>Conceived to second service</i>	<i>Conceived to third service</i>
MAP group				
Hay type A	9	3	3	1
Hay type B	10	2	3	3
Total	19	5	6	4
Cumulative % conceived		26.3%	57.9%	78.9%
Control group				
Hay type A	11	9	1	1
Hay type B	10	8	1	1
Total	21	17	2	2
Cumulative % conceived		81.0%	90.5%	100%

The thrice daily detection of oestrus was continued throughout the breeding period. Animals returning to oestrus following first inseminations and requiring second, third or fourth services were inseminated once 12 hr after the onset of oestrus.

Pregnancy was diagnosed in these animals by rectal palpation after an interval of at least 30 days following insemination.

One of the heifers in the experimental group came into oestrus on the day she was to have started on MAP and was then transferred to the control group. None of the experimental animals showed oestrus during the period of time they were being fed the MAP-concentrate mixture. In the MAP-fed group eighteen of nineteen animals showed oestrus within 2 to 4 days following the last day of MAP feeding. The average length of the synchronized oestrous cycle was 29.7 days. The remaining animal did not show oestrus but ovulated and conceived during the first period of expected oestrus. All of the control animals showed oestrus with an average cycle length of 20.2 days.

The results are given in Table 1.

The first service conception rate of the MAP-fed animals was 26.3%. Following the second service eleven of nineteen (57.9%) of the experimental group had conceived. The average length of the oestrous cycle of the MAP-fed animals returning to oestrus following first service was 18.7 days. After the third and

fourth services, the total percentage pregnant was 78·9 and 89·5, respectively. The length of MAP-treatment produced no effect on fertility.

The control animals had a first service conception rate of 81%. Following the second and third services, the percentage pregnant was 90·5 and 100, respectively.

The hay treatment had no effect on the fertility within the MAP-fed or control groups.

One animal in the control group aborted during the 6th month of gestation. The reason for the abortion could not be determined. No infectious diseases were diagnosed. All other animals in both groups gave birth to normal healthy calves at the expected time of parturition.

The results indicate that this product, at the level fed and the schedule used in this experiment, resulted in a reduced fertility level as compared to the control animals. From the current study the specific cause of the lowered conception rate cannot be explained. The possibility exists that at this level the compound may have had an adverse effect on the development of the ovum before ovulation or that it may have altered the uterine environment.

The authors wish to thank the Louis W. and Maude Hill Family Foundation for their financial support of this project. The work was also supported in part by U.S.P.H.S. Research Fellowship No. 5-F2-GM-15,000, for which gratitude is expressed. We are also indebted to the Upjohn Company, Kalamazoo, Michigan, for supplying the MAP used in this study.

REFERENCES

- HANSEL, W. (1965) *Evaluation of methods for controlling the estrous cycle*. Proc. Conf. on Estrous Cycle Control in Domestic Animals, Univ. of Nebraska, Lincoln. Misc. Publ. U.S. Dept. Agric. No. 1005.
- ZIMBELMAN, R. G. (1965) *Evaluation of some methods for controlling the bovine estrous cycle*. Proc. Conf. on Estrous Cycle Control in Domestic Animals, Univ. of Nebraska, Lincoln. Misc. Publ. U.S. Dept. Agric. No. 1005.