

present time this depends on experience and palpation, but eventually, hormonal status monitoring will be practicable.

c. *Stimulation of multiple ovulation*—In cycling animals or anestrus animals the principle is the same - a gonadotropin (PMS) is given near the end of a suppressive progestin regime whether natural (estrous cycles) or administered. In cycling animals, PMS can be given on day 16 of the cycle but since one does not know exactly when the CL will regress, this method leads to enormous variation in ovulation rate and a very unpredictable (usually low) proportion of the herd with twins.

The use of PMS near the end of a progestin suppressive regime improves synchronization of estrus and fertility and will give good control over ovulation rate. The relative rates of growth of the follicles induced by PMS and the rates of "release" of the CNS from the effects of the progestin are even more critical when attempting to induce multiple births. It is particularly important to select the correct dose of PMS and give it at the correct time relative to the decline in progesterone

or progestin. It is also necessary to reduce excessive growth of follicles (both rate and number), as they will reduce fertility.

#### Present Research

Modern research in this area centers around: (a) Obtaining NDA's for progestins - mainly problems of residues and no effect doses; (b) Developing practical methods for use of prostaglandins for synchronization; (c) Investigating the gonadotropin releasing factor (GRF) for stimulating follicle growth in anestrus, and for inducing multiple ovulations.

#### Role of the Veterinarian

By and large veterinarians are not confident in the use of hormones. There is a tendency to follow the label, which is an image that needs replacing. In the complex field of synchronization and multiple birth, selection of the correct dose of the correct hormone and giving it at the correct time will only follow from an understanding of the biology of the hormone and the endocrine status of the animals.

*This subject will be covered in more detail in the 1973 issue of The Bovine Practitioner.*

## Early Postpartum Breeding in Dairy Cattle

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An experiment was conducted to determine if there were detrimental effects from breeding Holstein dairy cows as soon as possible following calving. The study included 168 cows completing 375 calving intervals. At the time of first calving, cows were assigned at random to one of two breeding groups: 1) bred at first estrus following calving (early breeding), and 2) bred at first estrus 75 or more days following calving (late breeding). Heifers were placed on experiment at first calving and the maximum time that they remained on the experiment was until the 217th day of gestation with their fourth calf. Cows were observed for estrus twice daily and all animals were bred by artificial insemination using frozen semen from "proven" sires. Reproductive tracts during the postpartum interval were examined by rectal

palpation at seven-day intervals and ovarian structures were recorded. Pregnancy was determined 39 to 45 days after insemination. Cows were allowed a maximum of 300 open days following calving before being removed from the experiment as non-breeders. Treatment of reproductive problems was limited to three conditions occurring at the time of calving: 1) dystocia, 2) acute metritis, and 3) retained placenta.

There were 184 calving intervals in the early-bred group and 180 in the late-bred group. Fertility at first insemination, inseminations per diagnosed pregnancy, and number of open days for the early and late breeding groups, respectively, were: 37.0% vs. 66.7%, 2.2 vs. 1.6 and 64 vs. 101 (all  $P < .005$ ). Fertility at second, third and fourth inseminations and the return intervals following

infertile inseminations were similar for both breeding groups.

The overall occurrence of cystic ovaries was 42 of 375 calving intervals (11.2%). The percent cystic ovaries for the early and late breeding groups were 7.0% and 15.4%, respectively ( $P < .01$ ). However, cows in the early breeding group developed cystic ovaries later after calving and remained cystic longer than cows in the late breeding group. Of the 42 cases of cystic ovaries, 29 recovered without treatment and 13 were still cystic 300 days after calving. Sixteen of 168 cows were removed from the experiment for repro-

ductive failure, 13 with cystic ovaries, two with anestrus and one with complications following acute metritis. Significant differences between the two breeding groups were not found for percent of lost pregnancies (45 to 150 days gestation), retained placenta, acute metritis, dystocias, twins and abortions (151 to 260 days gestation).

The results indicate that although fertility was lower at the first post-partum estrus, the calving interval was shorter compared to the late-bred group. The data did not reveal persisting harmful effects from breeding cows as soon as possible following calving.

## Effects of Indwelling Uterine Infusers (IUI's) on Bovine Postpartum Reproductive Performance

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Bovine postpartum uterine conditions such as metritis usually require frequent medication to correct the problem. As a result, the indwelling uterine infuser (IUI) was developed to facilitate frequent infusion of the uterus.

This device was designed to remain in the uterus for a period of time with repeated infusions made through a cannula externally exposed from the vulva, reducing the introduction of infection and the possibility of trauma from daily medication by conventional procedures. The IUI is made of flexible polyethylene tubing which is inserted aseptically through the cervix into the uterus. The end inserted into the uterus is retained by an attached plastic coil which expands within the uterus. The exposed end of the medication tube projects a short distance from the vulva and is stoppered with a small plastic plug. When medication is administered, the plug is removed and a syringe with a 16 gauge needle can be inserted into the exposed end of the IUI.

Reports from veterinarians in the field suggested that the IUI was beneficial in altering estrous cycle length, stimulating estrous behavior, and in reducing the incidence of cystic follicles.

The objective of this study was to determine the effects of IUI's on estrous cycle length, estrous behavior, ovarian activity, and levels of luteinizing hormone in peripheral plasma.

### Materials and Methods

Data for this study were collected from 24 primiparous Holstein cows. They were allocated at random to one of three treatment groups at the time of first estrus and ovulation. There were eight cows per group treated as follows:

Group I—IUI inserted into the uterus at day 1 of the estrous cycle (estrus = day 0) and removed at the time of the subsequent estrus.

Group II—IUI inserted into the uterus at day 10 of the estrous cycle and removed at the time of the subsequent estrus.

Group III—Control.

These cows were kept in loose housing and milked in a parlor. They were fed grain, hay and corn silage to meet production requirements.

The reproductive tracts of these cows were palpated *per rectum* at least twice weekly, starting at 7 days postpartum. The following data were recorded at each observation and examination: 1) color of vulva and nature of discharge; 2) diameter