Estrus Synchronization of Beef Cows with A Palpable Corpus Luteum Using PGF_2a

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There are many small herds of purebred beef cattle ranging from twenty to fifty cows. Breeders of these herds would like to produce calves by artificial insemination using semen from the well-known sires of their breeds. Most beef cattle breed associations now allow registration of calves born from artificial insemination. However, these herds are part-time endeavors, and the owners seldom have either the time or management experience necessary for artificial insemination unless the procedure can be simplified.

Objective

To test under field conditions, an artificial insemination method that would require minimal labor and management.

Materials and Methods

The experimental animals were thirty-six cows. Twenty-one were 3 to 9-years-old, 55 ± 16.6 days postpartum and fifteen were 2-year-olds.

All cows were palpated to determine the presence of a corpus luteum or estrus. Four cows were determined to be in estrus and were inseminated. Twenty-five cows were determined to have a palpable corpus lutem and were injected with 25 mg $PGF_2\alpha$ im (Lutalyse--The Upjohn Co.). The remaining nine cows were anestrus. Jugular blood samples were collected for determination of progesterone concentrations at the time of examination and at 12 and 24 hours. Cows were injected with $PGF_2\alpha$ were inseminated 80 hours after injection.

Pregnancy status was determined 44 days after insemination by rectal palpation.

Result

Five of twenty-five cows inseminated 80 hours after the $PGF_2\alpha$ injections were pregnant. Eighteen of twenty-five cows with a palpable CL had peripheral serum progesterone concentrations above 0.7 nanograms/milliliter (ng/ml) at the time of the $PGF_2\alpha$ injections, and these concentrations declined at 12 and 24 hours later. Average progesterone concentrations for the 18 cows (ng/ml ± S.D.) were 2.6 ± 1.3, 0.7 ± 0.6, 0.4 ± 0.2 at 0, 12, and 24 hours, respectively. All five pregnant cows were from this group. Progesterone concentrations of the remaining seven cows were low or below the sensitivity of the assay at the time of injection and remained low 12 and 24 hours later.

Two of four cows determined to be in estrus by rectal palpation and inseminated were pregnant at the time of rectal palpation 44 days after insemination. Both these cows and one other cow had progesterone concentrations that were low or below the sensitivity of the assay for the three sampling times. The remaining cow of the four had progesterone concentrations of 1.5, 1.6, 1.6 at 0, 12, and 24 hours, respectively, suggesting an incorrect diagnosis.

Discussion

Only twenty percent of the cows determined to have CLs by rectal palpation and treated with $PGF_2\alpha$ were determined pregnant after insemination at 80 hours. Furthermore, only seventy-two percent of the cows palpated as having a corpus luteum had functional CLs as determined by peripheral progesterone concentrations. This finding suggests that an error was made in one of every four cows determined to have functional CL's at the time of palpation. This undoubtedly contributed to the low number of pregnant cows in this study. In an earlier study where palpation of a CL was used as a basis for $PGF_2\alpha$ treatment of beef cows, progesterone concentrations confirmed the presence of a functional CL in twenty-two of twenty-five cows (Ott et al., 1980).

Compared to a more conventional double injection scheme where all cows are injected with $PGF_2\alpha$ twice, eleven days apart, this method required only 33% of the number of $PGF_2\alpha$ injections (25 cows injected once vs. all 38 cows injected twice). A similar group of cows in close proximity to those in this study were inseminated at the same time by the same inseminators in another study. [2] Fifteen of 35 (43%) of these cows were pregnant following two injections of $PGF_2\alpha$ 14 days apart and insemination at 72 and 96 hours later. This method, however, required that the cattle be restrained in a chute four times vs. twice in the present study. Twice the doses of semen and three times the

amount of PGF $_{2\alpha}$ were also used.

Conclusion

Treatment of cows with a palpable CL followed by a single insemination at 80 hours, combined with insemination of estrus cows at the time of palpation resulted in seven of thirty-six (19.4%) cows pregnant by artificial insemination. **Results fell below expectations.** However, this method may be economically feasible in small herds where the management and labor necessary to achieve calves by artificial insemination **without the use of synchronizing agents** may be either **unavailable** or **the more costly alternative.**

References

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Information System for Vesicular Diseases

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An information system for animal diseases epidemiological surveillance should be the basic supporting structure of animal health services which administrate animal disease control programs. The main components of such a system should be as follows: (i) a monitoring mechanism of epidemiological events for data collecting; (ii) a set simple and speedy communication procedures guided toward users; (iii) a data processing scheme which is adjusted to the local environment conditions; (iv) an active surveillance mechanism directed toward critical diseases.

The information system for vesicular diseases, developed some years ago by the Pan American Foot-and-Mouth Disease Center, has been established in ten South American countries. In some of them it has been extended to cover other cattle diseases. Its main objectives are: (a) to identify and characterize animal diseases ecosystems; (b) to improve the effectiveness of disease control programs by assisting the decision making process associated with sanitary activities. This type of information system "uses" the animal health service organization itself its main functions being developed by the staff members. The tasks of such an information system "include" a wide range of the veterinary activities among which are the following:

1. Environmental analysis for animal diseases.
2. Development of epidemiological indicators.
3. Establishment of communication channels in the veterinary service (source-path-user).
4. Characterization of specific activities such as the observation of epidemiological events, data gathering, transmission, processing and interpretation as well as the difusion of epidemiological information.
5. Monitoring of animal diseases in order to:
   (a) define risk levels for cattle population exposure to different morbid agents in time and space;
   (b) know the dynamics of animal diseases difusion;
   (c) develop chronological models to forecast disease behavior;
   (d) identify sources and means of transmission;
   (e) delimit endemic and free areas establishing operational criteria of alarms and endemicity in order to define protection measures for free areas.
6. Evaluation of the progress of control programs.
7. Increased utilization of epidemiological information by staff members of animal health services.

This effort implied the utilization of new methodology beyond the traditional scope of sanitary statistical services.

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