would be virtually impossible to differentiate the different respiratory viruses on the basis of symptomatology. Less difficulty would be encountered in differentiating the viral respiratory diseases from other feline viral diseases. For example, the virus of panleukopenia causes a decreased leukocyte count and intestinal lesions(10) but feline pneumonitis is accompanied by a leukocytosis and no intestinal manifestations are seen.

In conclusion, all of the feline respiratory viruses have not been discussed in this paper, nor was it the intention of the author to do so. Neither was one or two viruses covered in depth to the exclusion of the other respiratory viruses. The primary aim of this paper was to review the field by the device of concentrating primarily on one virus which had been comparatively well studied, the feline pneumonitis virus, and then discussing the other viruses in relation to it.

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Artificial Insemination of a Commercial Beef Herd

Douglas Hageman*

Although artificial insemination (A.I.) was initially organized as a means of bringing the service of superior purebred dairy sires to average dairy farms with grade cattle, it has been widely used by breeders of registered purebred cattle. The purpose of this article is to describe the successful use of artificial insemination in a commercial beef cow-calf operation in central South Dakota.

Since genetic improvement has been shown through the use of artificial insemination, the same was expected in this herd. The advantages expected when this herd was started on a program of artifical insemination were: (1) increased weaning weights, (2) genetic imporvement in the herd through better replacement heifers and a more uniform set of calves, (3) advantages of using proven sires, and (4) reduction in the number of herd bulls required.

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This program of artificial insemination has been used on a commercial beef herd consisting of approximately 425 Hereford and Angus-Hereford cross-bred cows since June, 1961. Each female is identified by a tattoo and an eartag with numerals large enough to be identified from a distance.

All cows of breeding age which were detected in heat were bred by artificial insemination in 1961 and 1962. To improve efficiency of conception and to conserve labor and pasture, only yearling and virgin two year old heifers and those cows that were at least 45 days post-parturient were served by artificial insemination in 1963.

FACILITIES

The efficiency of this program can be credited to having adequate facilities. The A. I. pasture consisted of two sections of native grassland with a set of corrals in the center. (Figure 1) The cows to be served by artificial insemination were driven to this pasture 3 to 7 days prior to the breeding season.

Heat detection was by observation for visible signs of estrus. One man riding a working saddle horse was used for every 200 to 225 cows. As each cow was detected in estrum her eartag number was recorded, and she was later driven to the corrals and held until she could be inseminated.

When this program was started it was thought that handling range cattle as individuals would be quite difficult, but it was noted that when these cows were in heat they were much easier to handle, seemed to be less nervous, and were less concerned with strange activities.

These facilities were used for a 28 to 35 day artificial insemination breeding season. Following this relatively short breeding season herd bulls were turned out for 60 days to clean up. A short breeding season was used to overcome any difficulties encountered with artificial insemination such as inability to get desired conception and difficulty in heat detection. Thus, the bulls were turned out in time to clean up and still have the calves early enough in the Spring. Other reasons for a short artificial insemination breeding season were labor and available pastures close to the facilities.

HEAT DETECTION

Heat detection by observation worked best for this program with these conditions. Non-entry teaser bulls were tried but proved unsatisfactory in that it was ncessary to remove each cow detected in estrum before the bulls would make any attempt to find another. Another factor that made teaser bulls unnecessary was the observation that cows in heat do a great deal of moving and as they move through the herd they attract other cows in heat until groups ranging from 2 to 15 cows form.

The value of having the corrals located centrally was shown by the fact that cows in heat being held for insemination often attracted other cows in heat.

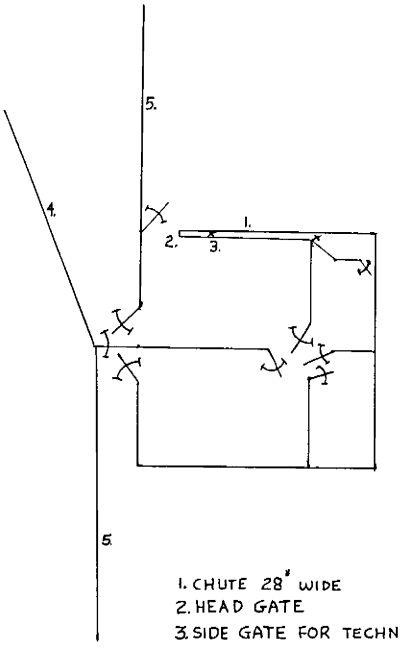
By trial it was learned that if the first observation of the herd was made at dawn and was followed by careful observation every 4 hours until dark, almost all of the cows would be detected as they came into heat. It was necessary to gather cows observed in heat just before noon and again just before dark.

Problems with heat detection on pasture were limited primarily to yearling heifers and first calf heifers as shown in Figure 2. We found that one factor having some relation to the detection of estrus in yearling heifers was the weight at one year of age. Our best results were obtained with those heifers weighing at least 450 pounds at one year of age. (Figure 3).

One method used by other ranchers in the area that has worked quite well for heat detection in yearlings has been to gather the entire herd of yearlings in a small yard in the evening. They are held overnight and fed a grain supplement in the evening and again the next morning before they are turned back to pasture. Those animals observed in estrus are removed each time they are fed and held until they can be inseminated.

INSEMINATION

The first year artificial insemination was used in this herd, the insemination was done by an A. I. technician. During the last two seasons this has been done by the author.



The method used in insemination has been to put the gloved hand into the rectum of the cow and to either grasp or fix the cervix in place. An inseminating tube is then inserted into the vagina and is guided into or through the cervix by means of the gloved hand in the rectum. This technique has given us excellent results.

Determination of the optimum time to breed has been by a rule of thumb that has met with success. Cows first observed in estrus in the morning were inseminated later the same day and cows first observed in estrus in the afternoon were inseminated before noon the next day. It was learned that it was best if cows were held for a short time after insemination for observation of continued signs of estrus. If a cow exhibited continued signs of estrus it was assumed she had been inseminated too early in the period and she was held and inseminated again twelve hours later.

SEMEN USED

In selecting semen, we found that in spite of the genetic merit of the bull used in this program, the acceptability of a bull for artificial insemination is based primarily on economic considerations. The hope of a future improvement in income by increased inherent herd production through the use of bulls of high-breeding worth weighs less on the scale of acceptability than does the possibility of an immediate decrease in herd production brought about by failure to get the cows in calf. Delayed conception may cause important financial loss to the herd owner by reducing the average calf weight (yield) per cow throughout her useful lifetime.

Our goal was to get at least a 70% non-return rate at 21 days from the first service with the semen use. This goal was not reached in all cases as shown in Figure 4. There are many bulls available for artificial insemination with good genetic background and good progeny records but the semen from many of these bulls will yield only a little better than a 50% non-return rate on first service. This point of using bulls with a high percent non-return rate is very important in using a limited breeding season such as was used in this commercial beef herd.

The semen used in this herd was purchased from a commercial A. I. center.

RESULTS

The results of this program have been evaluated from records obtained from production testing and pregnancy testing the herd each year.

The expense of breeding a beef herd by artificial insemination is comparable to that of natural service. The advantage of getting by with fewer bulls has been offset by the extra expense involved in artificial insemination of this herd.

A breakdown of the 1962 and 1963 artificial insemination records correlating the number of services per cow with the age of the cows is given in Figure 5. The difference of the number of services per

cow between the two years can be explained partially by the increased experience of the inseminator and partially by the extremely wet year in 1962 which caused a high estrogen content of the grass and this contributed to more abnormal estrous cycles.

The advantages expected when the program was started have been partially realized. Increased weaning weights of 35 to 50 pounds per calf, more uniform calves, and improvement of the herd through better quality replacement heifers are the advantages achieved so far.

Figure 2
Heat detection results from the 34 days breeding season used in 1963.

Total Number of females	Age years	Number Detected in heat	% Detected in heat
83	1	52	62.65
75	2	41	54.6
226	3-10	209	92.5

Figure 3
The weight relationship to heat detection in yearlings.

Weight range	Total number of females	Number detected in heat	% Detected in heat
380-420 lbs	15	6	40
421-440 lbs	9	2	22.2
441-460 lbs	6	6	100
461-480 lbs	14	7	50
481-550 lbs	34	29	85.3

Figure 4
The per cent of non-return rate in 21 days from semen used in 1963.

Bull	Number of cows served	Number of repeat-services	% non-returns
A	62	20	69.35
B	7	3	57
C	41	26	36.6
D	31	15	51.6
E	17	5	70.6

Figure 5
Records comparing the age and the number of services per cow in 1962 and 1963.

1962 Age yrs.	1962 Number of cows	1962 Number of services per cow	1963 Age yrs.	1963 Number of cows	1963 Number of services per cow
			1	53	1.150
1	74	1.635	2	41	1.122
2	20	1.050	3	34	1.264
3	118	1.383	4	127	1.181
4	11	1.545	5	13	1.540
5	12	1.600	6	14	1.714
6	16	1.000	7	11	1.363
7	14	1.714	8	17	1.000
8	10	1.400	9	11	1.091
9+	30	1.330	10+	19	1.368
?	7	1.571	?	11	1.272
Total	312	1.432	Total	353	1.213

Pregnancy Disease

Ronald G. Huhn*

History

Pregnancy disease is a highly fatal, acute metabolic disease affecting pregnant ewes during the last few weeks of gestation. It is characterized by acetonemia with fatty infiltration of the liver and is often associated with a low blood sugar. The condition is found wherever sheep are raised; it has been variously called stercoremia,(5) lambing paralysis, pregnancy toxemia, and lamzietke,(4) ketosis, (2) domzietke, acidosis, preparturient paresis, and hypoglycemic encephalopathy, (16,18,19) snow blindness, and twin lamb disease.(11) The entity has been widely studied if not always well studied.

Etiology and Pathogenesis

Because of the various conditions, both internal and external, which are associated with pregnancy disease, its occurrence has resulted in conflicting views concerning its etiology.

Miscellaneous suppositions

The disease has been diagnosed as a form of rabies.(2) Other viral and bacterial diseases were also considered but, because of the inability of fullfilling Koch's postulates, were discounted.(4,39) The attribution of the signs of the disease to

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