

A System for Calving Heifers on a Large Commercial Ranch

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Introduction

The Douglas Lake Cattle Company has grown from a homestead filed in 1872 in the Nicola Valley, British Columbia, alongside Douglas Lake. The ranch has passed through a succession of owners and has been enlarged to the point where it presently occupies 500,000 acres. The ranch has a carrying capacity of approximately 15,000 head of cattle on the bunch grass produced on the lower plateaus and hills and the timber grass of the high mountain slopes. Forage for winter feeding is produced on wet lowlands and irrigated hay meadows.

To maintain the Hereford cow herd at 6,000 to 7,000 head, it is necessary to calve approximately 1,000 heifers each year. Traditionally, all replacements were bred at two years of age to calve as three-year-olds on the open range in the spring. Early in the 1970's, a few heifers were bred as yearlings and the numbers have been gradually increased until 1976. To increase calf survival rates, a calving and maternity unit, Figure 1, was constructed in 1972 to accommodate approximately 1,000 heifers calving over a short period of time.

Following the calving season in 1974 when twenty percent of the calves died of neonatal diarrhea, the Western College of Veterinary Medicine at Saskatoon, Saskatchewan has provided a team of clinicians and senior students to assist with the operation of the calving and maternity unit during March and early April. The students receive credit in large animal clinics for their time spent as an external rotation. The main objective of the program is to turn out as high a percentage as possible of live, healthy calves at their mother's side ready to go onto open range.

Description of System

The calving-maternity unit is located in approximation to existing facilities consisting of working corrals, scales and feeding pens. The main feature of the unit is a maternity barn with fifty-five 8 x 10 foot box stalls, Figure 2. The floor of the pens and center alleyway is compacted porous sand. The calving section is located across one end of the maternity barn, Figure 3. Adjacent to the calving area is a preparation and storage and observation room. The entire calving-maternity unit operates on a continuous through-put basis.

Two to three weeks before the beginning of the calving season, the pregnant heifers are moved from the winter feeding area to a large pre-calving holding area. Each day, or every few days, heifers which appear to be within a few days of calving are cut out, Figure 4, and moved to one of two observation pens, Figure 5. In the observation pens, the heifers are mechanically fed loose hay in fence-line feed bunks. The pens are bedded with shavings and have overhead lights to facilitate twenty-four hour surveillance by the cowboys and veterinary students. The smallest observation pen can be continuously observed through windows in the preparation room of the calving section. Usually heifers which are expected to calve within twenty-four hours are placed in the small observation pen to allow easier observation during darkness. The large observation pen is scrutinized by riders on horseback. Heifers requiring assistance are moved with horses into the restraining chute in the calving section. A minimal amount of records is maintained to provide critical information each year. The number of heifers requiring assistance in 1976 and 1977 is presented in Table 1. The interval (in days) required for 90% of all calvings to occur is illustrated in Figure 6.

Calves born without assistance are left in the observation pens and observed to be certain they suckle colostrum and that the heifer accepts or "mothers" them, Figure 7. Usually, after 12 to 24 hours when the newborn calf and mother have "paired off" well, those which do not nurse and heifers which do not accept their calves are moved into the maternity unit for special care.

Every calf born with assistance is weighed, identified with a numbered ear tag and the navel is disinfected with iodine. The frequency distributions of birth weights in 1976 and 1977 are presented in Table 2. Heifers are milked and the amount of colostrum produced recorded, Table 3, and fed to the calf either by stomach tube or nursing bottle. For the past two years samples of blood, colostrum and feces from the heifer and blood from the calf have been collected for immunological and bacterial studies. Assisted calves and heifers are quickly moved into a box stall bedded with straw in the maternity barn, Figure 8. All heifers requiring a caesarean section or noted to have udder or reproductive problems are marked for culling.

Assisted heifers and their calves are placed in clean, well-bedded box stalls in the maternity barn so that a bank of stalls is occupied at one time while another bank is being cleaned and scraped and allowed to dry. While in the maternity barn, the calves and heifers are regularly observed for nursing, mothering, expulsion of placenta, neonatal diarrhea, or other problems. A daily record for each heifer and calf is kept up to date. When calves are nursing strongly and paired with their dam, they are moved from the barn to the first post-calving holding area (see Figure 9), usually after 24 hours in the barn. Any calves encountering difficulty are kept in longer until they are ready to go out with the heifer.

Heifers and calves in the first holding area have access to an automatic waterer and are mechanically fed loose hay on the ground. They are observed frequently by cowboys for mothering, nursing and health problems. After several days in the first holding meadow, they are all paired up and moved to a second holding meadow (see Figure 9) where they remain for several more days. Finally, they are moved to a third large meadow where they will remain until they are moved out to spring pasture. All holding meadows are regularly observed and any animals with problems are moved back to nearby pens at the maternity unit for necessary attention.

Guidelines for Assistance

The first sign of parturition often is the passing of the cervical seal which shows as a thick, tenacious mucus clinging to the vulva or tail. Heifers may begin parturition anywhere from two hours to two or three days after passing the cervical mucus. Frequently the heifers will pass vaginal secretions from the vulva when lying down which often resembles the cervical seal. The stage of relaxation begins about one to three hours before the beginning of the first stage of labour. During relaxation the heifers are usually noticed to be carrying their tails elevated and to be slowly walking around the resting area sniffing the ground. Occasionally they will turn their heads towards the flank and switch their tails. This behaviour appears to be a reliable indication of imminent parturition. As the heifers progress into the second stage of parturition, abdominal contractions become evident and the chorio-allantoic membrane usually protrudes from the vulva in 30 to 60 minutes. During this stage, the heifers are frequently very restless and may get up and change position several times. During this period of restlessness the chorio-allantoic membrane usually ruptures and fluid is expelled. Abdominal contractions become more forceful and protrusion of feet, encased in the amnion, from the vulva is frequently seen in 5 to 30 minutes. Heifers normally expel the fetus in 30 to 60 minutes after the chorio-allantoic membrane has ruptured. Heifers which are observed not to be making any progress or have gone over 60 minutes of hard labour without expulsion of the fetus, are brought into the working area for assistance.

Heifers which have been in hard labour without

progress for about one hour will frequently tire and cease labouring and get up and start to walk around and enter a stage of inertia. Occasionally, cowboys provide light hand assistance in observation pens to heifers which remain recumbent when approached, Figure 10. These guidelines for assistance have been established in order to ensure as high a percentage of strong viable calves as possible.

Management of Peri-Parturient Health Problems

In view of the problems with neonatal diarrhea encountered in 1974, the prevention of calf scours is given highest possible priority. Measures to prevent scours are begun in the fall before the calving season when the observation pens are scraped clean and manure and old bedding are hauled away. The pens are then left vacant over the winter until the heifers are moved in just prior to calving. The pens are amply bedded with shavings and sawdust to provide clean dry resting areas. If there is a heavy snow cover on the ground, equipment is brought in to scrape and remove the snow from the observation pens. The second major concern is to prevent overcrowding in the observation pens. The pens are stocked so that each pre-parturient heifer has a minimum of 750 to 900 square feet per head. Every effort is made to ensure that each calf receives colostrum within 6 hours of birth. The box stalls in the maternity barn are freshly bedded before each use and are rotated in their use so that they may be thoroughly cleaned out and dried after they are emptied. The heifers and calves are moved to dry holding areas as soon as the calf is nursing and strong enough to follow its mother. Each cow-calf pair initially has a minimum area of approximately one acre in the post-calving holding areas, which is slowly reduced to a minimum of one-half acre per pair. If a calf develops diarrhea, it is promptly treated with oral electrolytes and fluids and antibacterials and is confined in a box stall. Calves recovered from diarrhea are usually not moved into the holding areas but into a separate isolation area for further observation. Since 1974, the incidence of neonatal diarrhea has been negligible.

Maternal neglect of calves requires constant surveillance. Every calf that is born is closely monitored to be certain it is nursing and the heifer accepts it. Heifers which refuse to mother their calves are confined to box stalls and are tied up twice a day, if necessary, to allow the calf to nurse. If the calf is too weak to nurse or refuses to suckle, the heifer is milked and the calf fed by stomach tube. Calves which are born weak or suffer from exposure are placed in incubators with heat lamps and are bottle fed or fed with a stomach tube. The ranch personnel firmly believe that the mothering instinct is strongly stimulated by a vigorous and aggressive calf, and therefore the majority of Hereford heifers are bred to Angus bulls in an attempt to increase the neonatal viability. Frequently heifers which produce weak calves and those with prolonged or difficult births are



Figure 1. The holding pen and observation room of the calving unit overlooking small observation pen at Douglas Lake ranch.

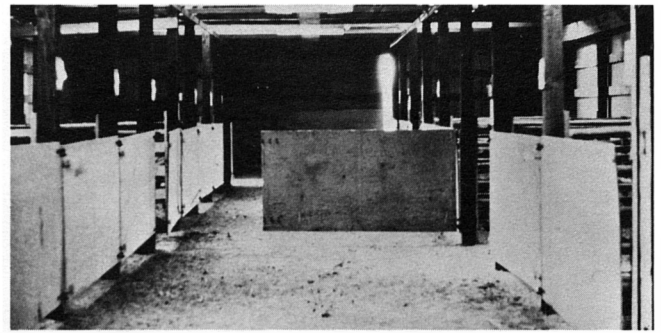


Figure 2. The main corridor of the maternity barn with box stalls on either side.



Figure 3. Final year veterinary students preparing a heifer for a caesarean in the surgery of the Douglas Lake ranch calving facility. Note the left wall of the restraining chute swings completely away for easier accessibility.



Figure 4. Douglas Lake ranch cowboy selecting those heifers that will calve soon. They will be run into the lighted observation pens alongside the maternity unit.



Figure 5. Preparturient heifers on a bed of shavings in the small calving pen viewed from the observation window.

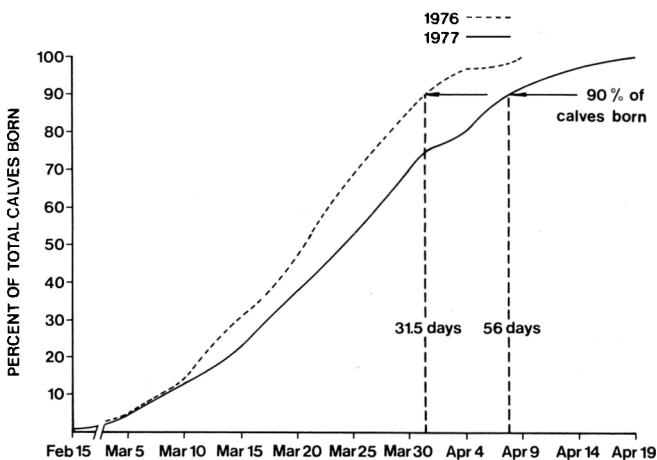


Figure 6. Cumulative calving frequency of 965 2-year-old heifers in 1976 and 316 2-year-old heifers in 1977.



Figure 7. First-calf heifer "mothering up" her newborn calf.



Figure 8. Calf born by caesarean section and heifer in a boxstall. Note the rails placed near the outer wall to provide the calf a protective creep from fractious heifers.

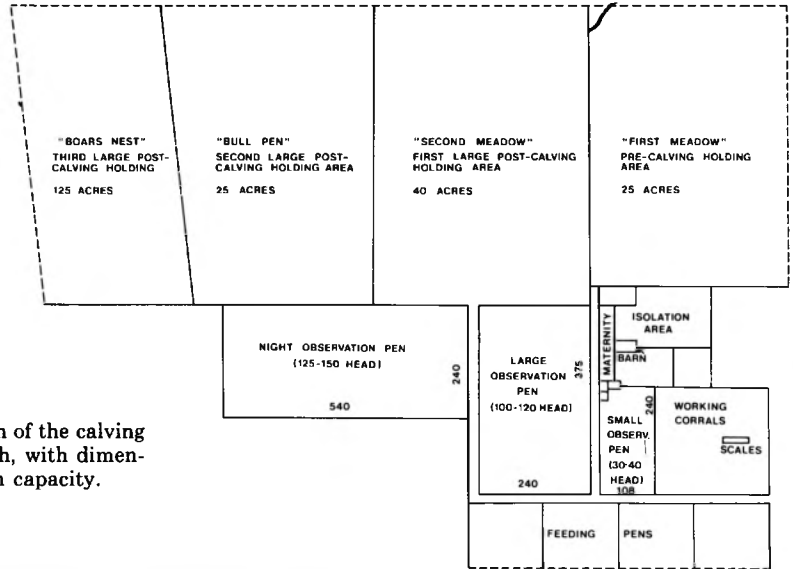


Figure 9. Schematic representation of the calving facility at the Douglas Lake ranch, with dimensions in feet and approximate pen capacity.



Figure 10. Douglas Lake ranch cowboys providing minimal assistance to a heifer calving in the observation pen.

Table 1
Classification of Parturition

Type of Calving	Number of Calvings * (%)	
	1976	1977
Unassisted	616 (64)	177 (57)
Caesarian delivery	59 (6)	36 (11)
Assisted minimally in pen	---	17 (5)
Assisted in maternity barn	290 (30)	86 (27)
Total	965 (100)	316 (100)
*Calves lost at birth or shortly after	51 (5.3)	12 (3.8)

Table 2
Weight of Calves Born With Assistance

Weight Range	Number of Calves (%)	
	1976	1977
40-49 lbs.	2 (1.4)	---
50-54 lbs.	6 (4.0)	1 (0.9)
55-60 lbs.	33 (22.2)	9 (8.7)
61-65 lbs.	38 (25.8)	16 (15.4)
66-70 lbs.	32 (21.6)	35 (33.6)
71-75 lbs.	30 (20.3)	23 (22.0)
76-80 lbs.	7 (4.7)	12 (11.5)
81-85 lbs.	---	5 (4.8)
86-90 lbs.	---	3 (2.9)
Total	148 (100)	104 (100)
Mean calf wt.	66.2 lbs.	70.6 lbs.
Mean dam wt.	772 lbs. (n=480)	884 lbs. (n=246)

Table 3
Amount of Colostrum Milked from Heifers at Parturition at the Douglas Lake Ranch

Amount of Colostrum Obtained	Number of Cows (%)	
	1976	1977
Less than 500 ml	65 (52.4)	35 (53.8)
500-1000 ml	55 (44.4)	27 (41.5)
1000-2000 ml	4 (3.2)	3 (4.6)
Total	124 (100)	65 (100)

liable to neglect their calves. Orphaned calves are "grafted" onto good milking and good mothering heifers if they have lost their calves.

The cowboys supervising the newborn-dam pairs in the post-calving holding meadows continually watch for abandoned calves or those which have been attacked by predators. Coyotes, ravens, magpies and eagles are common predators and will quickly attack weak or neglected newborn calves. Coyotes may be seen almost every night in the lighted observation pens in spite of the presence of pen riders.

Conclusions

A practical system has been evolved on this ranch for calving and handling up to 1,200 head of heifers over a short calving season. Pre-parturient heifers are sequentially moved from pre-calving pens through observation pens and the maternity unit as they are observed to approach parturition. The heifers are subject to continual 24-hour surveillance. Following parturition, heifers which have accepted their calves, and calves which are strong enough, are moved to large low-density holding meadows. Precautions to prevent overcrowding and wet, dirty pens and maternity stalls have been successful in the prevention of neonatal diarrhea.

Acknowledgements

The work was supported by funds from the Saskatchewan Horned Cattle Trust Fund, the Alberta Cattle Commission, the Alberta Agricultural Research Trust, and the National Research Council of Canada. The authors acknowledge the co-operation and support of the interdisciplinary group of the Western College of Veterinary Medicine which has been investigating the epidemiology of acute undifferentiated diarrhea of newborn calves. The capable assistance of the cowboys at the ranch and the assistance and encouragement of Mr. Neil Woolliams, ranch manager, are also acknowledged.