

Herd Health Management for Beef Cow/Calf Operations

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The purpose of this paper is to discuss the components of a herd health program for beef cow/calf herds. The paper will be directed at improving and maintaining optimal reproductive efficiency in the beef cow and management of the calves up to weaning.

There are four components of a beef herd health program. These components are: 1) prebreeding, 2) pregnancy diagnosis and weaning of calves, 3) winter feeding management, and 4) precalving and calving. These are the primary times that the herd health veterinarian will want to visit the ranch.

Prebreeding

The prebreeding visit should be done about one month before the start of the breeding season. On this visit the veterinarian will examine the bull for breeding soundness. This should include measuring scrotal circumference. A bull with a large scrotal circumference has been shown to sire heifers that reach puberty at an earlier age than bulls with a smaller scrotal circumference. Also scrotal circumference is directly related to quantity of semen produced. Semen should be examined for motility, morphology, and quantity. A physical exam should be done paying special attention to problems that could hinder breeding ability such as lameness, preputial defects, and penial abnormalities. Now, evaluating past performance, production records, and the results from the breeding soundness exam the veterinarian should make recommendations concerning the most efficient ratio of bulls to cows. The literature has shown that a good bull can efficiently breed 50 cows during a single breeding season. By maintaining a higher ratio, the producer is able to have more control over selective breeding.

Also on this visit the veterinarian should study the records of last years herd to detect causes of inferior reproductive performance and begin correcting these problems. When evaluating the records of a ranch, there are four main categories that must be studied. These categories are: 1) number of females pregnant at the end of the breeding season, 2) number of cows that have calved, 3) number of calves that have lived through the prenatal period, and finally 4) the number of calves that live from birth to weaning. These four categories are what are used to figure the "net calf crop". By definition the net calf crop

is the number of calves weaned as a percentage of the females exposed to the bull during the breeding season. This figure shows the four categories of the reproductive cycle and the percent loss associated with each category.

1) Females not pregnant at the end of the breeding season	17.4%
2) Prenatal calf death	6.4%
3) Calf deaths birth to weaning	2.9%
4) Fetal deaths during gestation	2.3%

The values shown in this figure are representative of a national survey. Using these values the net calf crop would be approximately 71%. It should be noted that there are some very well managed and successful ranches that are achieving net calf crops of approximately 90%. According to Rice (1986) a good, realistic goal for net calf crop should be 86% (95% breeding efficiency X 95% survival at birth X 95% nursing survival = 86% calf crop).

Some basic goals of the herd health program to improve and maintain a high level of reproductive performance must be discussed. One goal is to increase the percentage of females showing estrus during the first 21 days of breeding season. To accomplish this there must be adequate postpartum rest before breeding. A postpartum interval of 60 days should be optimal, but a 50 day interval is considered adequate providing body condition is satisfactory. Another very important factor influencing the onset of estrus is the body condition score (BCS) at calving. It is well documented that a good BCS at calving produces an earlier onset of estrus than a poor BCS. Several scoring systems have been utilized but the one most commonly in use in the United States is a nine point scale (1 to 9) as described by Spitzer and Herd:

Thin Condition

BCS 1. *Emaciated.* Cows extremely emaciated with no detectable fat over spinous processes, transverse processes, hip bones and ribs. Tail-head and ribs project quite prominently.

BCS 2. *POOR.* Cow still appears somewhat emaciated but tail-head and ribs are less prominent. Individual spinous processes are still rather sharp to the touch, but some tissue

cover exists along spine.

- BCS 3. **THIN.** Ribs are still individually identifiable but not quite as sharp to the touch. There is obvious palpable fat along spine and over tail-head with some tissue cover over dorsal portion of ribs.

Borderline Condition

- BCS 4. **BORDERLINE THIN.** Individual ribs are no longer obviously visible. The spinous processes can be identified individually on palpation but feel rounded rather than sharp. Some fat cover over ribs, transverse processes, and hip bones.

Optimum Condition

- BCS 5. **MODERATE.** Cow has generally good overall appearance. Upon palpation, fat cover over ribs feels spongy, and areas on either side of tail-head now have palpable fat cover.
- BCS 6. **HIGH MODERATE.** Firm pressure now needs to be applied to feel spinous processes. A high degree of fat cover is palpable over ribs and around tail-head.
- BCS 7. **GOOD.** Cow appears fleshy and obviously carries considerable fat. Very spongy fat cover over ribs and over and around tail-head. In fact "rounds" or "pones" are beginning to be obvious. Some fat around vulva and in the twist area.

Fat Condition

- BCS 8. **FAT.** Cow very fleshy and over conditioned. Spinous processes almost impossible to palpate. Cow has large fat deposits over ribs, around tail-head and below vulva. "Rounds" or "pones" are obvious.
- BCS 9. **EXTREMELY FAT.** Cow obviously extremely waste, patchy and looks blocky. Tail-head and hips buried in fatty tissue and "rounds" or "pones" of fat are protruding. Bone structure no longer visible and barely palpable. Animal's mobility may even be impaired by large fatty deposits.

A common question asked is if it is economically feasible to pay the extra feed costs to get cows up to optimal body condition scores. The answer is yes it is feasible and the data in Tables I and II demonstrates how this is accomplished. Finally, removal of the suckling response on the cow by the calf will help facilitate the start of estrus. Removal of the calf for a period of 48 hours prior to the start of the breeding season is recommended, (calf removal is of no help for BCS of 5 or less). The suckling of the calf

causes an inhibition of the release of GnRH which is needed for release of LH for the start of estrus. Studies have shown that there are no negative effects on the calves for this short period of time (ie: does not show an increase in disease).

A second goal is to increase conception rate at first service. Again a good BCS (5, 6, or 7) is very important in accomplishing this goal. Research has shown that an increase in the nutrition of the cows starting three weeks before breeding and then maintaining this high plane of nutrition through the breeding season increases conception rates.

The replacement heifers must be at a critical minimum weight by the start of their breeding season (about 28 days before the cows season). The onset of puberty is affected by age and weight of the animal. A rule of thumb is 65% of the mature weight of the heifer at 13-15 months of age, however; there will be breed variations that each ranch manager must be aware of for his particular herd.

A third goal is to shorten the length of the breeding season to 60 days or less (45-60) from the traditional length of 90 days or longer. By doing this the calves will be born earlier in the season and there will be a more uniform weight of the calves. They will have a longer period of time to grow before weaning hence; they will have a higher average weaning weight. Equally important, the short calving season provides the desired postpartum rest necessary for a high percentage of cows in heat during the first 21 days of the breeding season. The fourth and final goal is to decrease calf losses due to dystocia and neonatal disease.

Pregnancy diagnosis and weaning of calves

These two events are included in the same visit because they occur essentially at the same time. The ideal time to pregnancy check the cows is 35 to 45 days after the end of the breeding season. However, this is often impractical for large range type herds. For this reason pregnancy diagnosis is not done until weaning of the calves and the cows are often several months into gestation.

At pregnancy diagnosis time, the veterinarian will cull open cows and often cows recently bred that will calve too late next season. Also cows will be culled for non-reproductive reasons such as squamous cell carcinoma, mastitis, lameness, and bad teeth.

During this visit the herd health veterinarian will be able to assess the reproductive performance of the herd. Some areas he will look closely at are: 1) pregnancy rate, which is the number of females pregnant compared to the number exposed at breeding (this should be close to or above 95%), 2) weaning weight of each calf and the average weaning weight per cow exposed at breeding, 3) BCS of the cows and heifers, and 4) net calf crop (86% or higher), based on cows exposed the year before. Now he can make some recommendations that will

help improve next years herd.

There are different approaches to management of the calves at weaning time. Some of the well managed ranches are castrating, dehorning, and branding at six to eight weeks of age rather than at weaning because it is less stressful on the calves. However, treatment with systemic insecticides for warbles, lice, and deworming along with vaccinations is recommended at weaning time. It is important to perform these procedures two to three weeks before weaning so that the only stress at weaning time is weaning. The recommended vaccinations at this time are directed against those agents that are a problem on that ranch. Only the veterinarian that routinely deals with the ranch is going to be able to develop the best vaccination schedule for that particular ranch.

Winter feeding management

This is the third visit to the ranch and one of the items to be discussed is the health and management of the pregnant females. This will be directed primarily at the nutrition of the first calf heifers. A poor level of nutrition is going to have a negative effect on all ages of cows but this will be even more severe in the first calf heifer. A poor level of nutrition will cause a higher incidence of dystocia, a longer anestrus period, and a lower conception rate all of which lowers the net calf crop. Some guidelines to follow for the pregnant females are: cows should maintain optimal BCS or gain weight to achieve optimal BCS by calving season, first calf heifers, young cows, and mature cows should be divided into groups for winter feeding, periodically each group should be checked to assess BCS through the winter, and the winter diet of pregnant cattle should provide the nutritional requirements for maintenance and pregnancy.

Another group of cattle that will be maintained through the winter are the breeding bulls. Because often times the bulls coming off the range are at a poor BCS, it is important for the producer to provide an adequate level of nutrition so the bulls are at a BCS of 6 to 7 by the start of the next breeding season.

The last group of cattle are the replacement heifers. They should be managed so that they are at their critical minimum weight by the start of their breeding season, which as I previously indicated, should be about 30 days before the rest of the herd. Also, the replacement heifers need to be vaccinated for reproductive diseases. These include IBR, BVD, Lepto, and Vibrio. The timing of these vaccinations depends on the type of vaccine used and the herd health veterinarian should follow recommendations of the manufacturer.

Precalving and calving

This is the fourth and final scheduled visit to the

ranch. Management at calving to minimize perinatal mortality due to dystocia and abnormal maternal behavior will be one of the topics discussed on this visit. The group of cattle that need to be watched the closest will be the first calf heifers. In order to do this it is recommended to separate the heifers from the more mature cattle. At the first signs of dystocia there needs to be professional intervention. A dystocia, by many now, is considered anything longer than one hour after the water has broken (start of stage II).

Once a live calf is on the ground the attention is directed towards control of acute undifferentiated infectious diarrhea and other infections of the newborn beef calf. The major causes of neonatal diarrhea and death are: 1) E. Coli, 2) Rota virus, 3) Corona virus, and 4) Cryptosporidia. There are some basic management principals for the prevention and control of calf diarrhea. One of these is to provide a clean environment for the calf to reduce the infection pressure on the calf. Another is to establish a high level of colostral immunity in the calf. To accomplish this it is important that the calf nurse within the first six hours of life. Third is to increase the specific immunity of the calf. If there is a specific problem with one of the agents listed earlier as a cause of calf diarrhea, the cows can be vaccinated for most of these agents one month before calving in order to have specific high levels of colostral antibody. Finally, it is important to decrease stress in the calves. This is done by providing good protection from the environment, and not overcrowding the calves.

Records of calving are very important when the herd health veterinarian is trying to find areas of the program that are responsible for unacceptable losses. Some records that must be kept are calving dates, number of abortions and which cows aborted, number of dystocias and which cows had problems with dystocias, and calf viability, (which calves were sick, what was the nature of the sickness, and how was the sickness managed).

The final topic to be dealt with on the precalving and calving visit is the management of the calves from two months of age to weaning. Procedures here are going to vary from ranch to ranch, however; there are some common principles that must be followed by all ranches. As was stated earlier, many operations are branding, dehorning, and castrating at 6-8 weeks of age. Also at this time, growth implants should be implanted, and all calves should be vaccinated for Clostridial agents. Most operations will need to vaccinate the heifers for Brucellosis starting no earlier than 4 months of age. Other vaccinations will depend on the specific needs of that particular ranch. At this time the calves will be turned out on the range and only isolated problems will need to be addressed (ie: pink eye, and bloat).

Summary

The purpose of this paper is to discuss herd health management for beef cow/calf herds. Herd health is a very broad topic and cannot be covered in detail in one short paper. However, this paper should provide a good overview of what a veterinarian needs to be aware of when managing beef cow/calf herds.

References

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Editor's Note: Steve Lucas was awarded the second prize of \$100 for his student clinical paper.

Abstracts:

Bacterial flora of the uterus of cows after calving on two hygienically contrasting farms

D.E Noakes, L. Wallace, G.R. Smith

Veterinary Record (1991) **128**, 440-442

Intrauterine swabs were obtained from cows after calving on two commercial dairy herds with contrasting hygienic environments and incidence of leucorrhoea, and cultured aerobically and anaerobically. Of 26 cows with a normal calving and puerperium, eight of 14 (57 per cent) were sterile on farm B where hygiene was poor, compared with five of 12 (42 per cent) on farm A where hygiene was better. Two cows on farm B retained their placentas and subsequently developed metritis/endometritis. *Actinomyces pyogenes* was the commonest bacterial isolate and *Fusobacterium nucleatum*, *Proteus mirabilis* and *Bacteroides melanogenicus* were also frequently observed. Similar isolates were obtained from cows on farm B with parturient or puerperal disorders. The contrasting hygienic environments had no influence on either the quantitative or qualitative uterine bacterial flora. Thus, the difference in the incidence of endometritis must have been due to factors other than hygiene.

Effects of growth on functional and morphological echocardiographic variables in Friesian calves

H. Amory, R. Lekeux

Veterinary Record (1991) **128**, 349-354

For echocardiography to become a reliable tool for the diagnosis, monitoring and prognosis of cardiac diseases in cattle, it is necessary to determine normal values of echocardiographic variables and their changes during the growth of healthy animals. In this study, 53 echocardiographic protocols were collected from 17 healthy Friesian calves during their period of growth. The protocol consisted of the measurement or calculation of 10 dimensional and six functional variables from M-mode long axis views of the heart. The relationships between these variables and age, bodyweight and body surface area were analyzed. Most of the dimensional parameters increased significantly with body size and were best predicted by an allometric regression. However, the functional indices did not change with growth, and the normal values obtained in this study may be applied to calves of any bodyweight.

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