

BEEF

Chapter 36

Health Considerations: Beef Replacement Heifers

Russ Daly

SDSU Extension is an equal opportunity provider and employer in accordance with the nondiscrimination policies of South Dakota State University, the South Dakota Board of Regents and the United States Department of Agriculture.



Chapter 36:

Health Considerations: Beef Replacement Heifers

Introduction

Cow-calf producers need to continually replenish their breeding population with new replacement females. The success of a cow-calf enterprise depends on the long-term, as well as short-term, reproductive success of these animals. New heifers must grow and develop at an adequate rate to cycle and become pregnant with the rest of the breeding herd. In addition, heifers are still growing at the time they have their first calf, yet sufficient body condition is necessary in order for them to breed back for their second calf. These goals are not achievable unless replacement heifers are in optimal health. Moreover, younger females within a herd are typically disproportionately affected by infectious reproductive diseases. For these reasons, cattle producers must address the health of replacement females from calthood through their successful addition to the breeding herd.

Health Considerations For Home-Raised Replacement Heifers

Choosing replacement heifers from within one's own cow-calf operation can help maintain consistency within a herd while allowing for steady, if not rapid, genetic progress. From a health standpoint, the advantages of home-raised heifers include knowledge of previous health and treatment programs, and no risk of introducing new infectious agents from outside herds.

Vaccination Programs

Health programs for replacement heifers, including vaccinations, begin early in the life of the heifer. A vaccination program that helps prevent clinical effects of disease in calves before and at weaning (e.g. respiratory disease) is important for replacement heifers as well as commercial calves. These calthood diseases may have negative effects on growth and development important to reproductive performance later on.

Pasture, Pre-Weaning, and Weaning Vaccinations

A vaccination program addressing the needs of all calves in the herd

Key Points

- Health programs for replacement heifers should begin early in the life of the animal.
- Timing and product choice are important considerations for replacement heifer vaccination programs.
- Internal parasite loads can have a detrimental effect on replacement heifer growth and productivity and are important to address with a parasite control program.
- Producers buying replacement heifers should learn as much as possible about the health of the source herd.
- Purchased replacement heifers should be segregated from the resident herd for 30-60 days, allowing time for pathogen shedding to decline, for diagnostic testing, and for appropriate vaccinations to be administered.

should be developed with professional input from a veterinarian. Minimizing disease risks through these early stages of life prepares a future replacement heifer for optimal growth and development.

Through weaning, female calves identified as replacements need not undergo any different vaccination program than other, commercial calves in the herd. However, if replacement candidates have been identified at (or before) weaning, producers may consider initiating the immune response against two reproductive diseases that are not included in pre-weaning and weaning vaccination programs: leptospirosis and vibriosis.

Leptospirosis is a bacterial disease affecting the reproductive system, but it is not typically transmitted venereally. In other words, heifers may contract this infection as calves, prior to entering the breeding herd. In the case of *Leptospira borgpetersenii* serovar hardjo type hardjo-bovis (“Lepto hardjo-bovis”), calves contract the infection through contact with the urine and other excretions of infected cattle. Other types of leptospirosis – those typically included in “5-way lepto” vaccines (*Leptospira interrogans* serovars hardjo, canicola, pomona, grippotyphosa, and icterohemorrhagiae) – may be contracted through contact with wildlife and other animals.

Vibriosis is a reproductively-transmitted disease caused by the bacteria *Campylobacter fetus* subsp. *venerealis*. While not a threat until heifers are in contact with potentially-infected bulls, vibriosis vaccine is often administered to cattle in conjunction with leptospirosis vaccines (e.g. “Vibrio-lepto” vaccines). Because this vaccine is against a gram-negative bacteria, producers should consult with their veterinarian before adding this vaccine to their pre-weaning and/or weaning vaccine program. Administration of more than two gram-negative vaccines to an animal at the same time may result in a condition called endotoxemia.

Brucellosis Vaccination

Also referred to as “Bang’s vaccination”, brucellosis vaccine produces immunity against *Brucella abortus*, a bacterial reproductive disease that has been the subject of eradication efforts in the US since the 1930’s. As a result of vaccination and testing, the US

domestic cattle herd currently is free of this disease. Pockets of infection exist in wild bison and elk populations only in the Yellowstone National Park region. In the rest of the US, brucellosis vaccination generally allows more convenient movement of individual animals across state lines and provides an official form of animal identification (the orange “Bangs” tag). Only heifers between the ages of four and 12 months are eligible for brucellosis vaccination, and must be vaccinated by an accredited veterinarian.

Pre-breeding Vaccinations

Bovine Viral Diarrhea Virus (BVDV) and Infectious Bovine Rhinotracheitis Virus (IBRV or “red nose”) are important viral reproductive pathogens. They are also typical components of pre-weaning and weaning respiratory vaccination programs for commercial calves. If replacement heifers have been previously vaccinated against these pathogens as calves, the pre-breeding dose of vaccine will act as a booster as well as provide opportunity for heifers not responding to earlier vaccinations to develop immunity. Many pre-breeding vaccines additionally contain the viral antigens Parainfluenza-3 (PI-3) and Bovine Respiratory Syncytial Virus (BRSV). These are not reproductive pathogens, but are common components of respiratory combination vaccines marketed by animal health companies. Their inclusion will not hamper the immune response against BVDV and IBR. These viral vaccines are available in modified live (MLV) or killed virus (KV) formulations.

As mentioned previously, vaccination against vibriosis and the appropriate serovars of leptospirosis should be a part of the pre-breeding vaccine program. Lepto hardjo-bovis is not included in all leptospirosis vaccines, and there is conflicting information whether the traditional 5-way leptospirosis vaccines are protective against this pathogen. Therefore, care should be taken to ensure that the chosen vaccine contains the serovars deemed important by the producer and veterinarian. Leptospirosis and vibriosis vaccines are killed bacterins.

The timing of administration of these vaccines is important. Reduced pregnancy rates can be expected

when MLV vaccines are given to naïve heifers (heifers that have not been previously exposed to or vaccinated against IBR) close to the time of breeding. This is due to the detrimental action of the MLV IBR component on the naïve heifer's ovaries. For this reason, MLV pre-breeding vaccines should be administered no later than 30 days prior to breeding, especially in animals with unknown or no history of previous IBR vaccinations. Killed virus vaccines do not result in the disruption in pregnancy rates for naïve heifers as do the MLV vaccines. However, in order to optimize their effectiveness, killed vaccines necessitate the administration of two doses prior to breeding. Individual vaccine labels may vary, but in general, a 4-week interval between the first and booster dose is typical, with the second dose of vaccine given no later than 30 days prior to breeding.

Discussion with a veterinarian is advised to best address these situations in your herd.

Internal and External Parasite Control

Internal parasite loads can have a detrimental effect on calf growth and reproductive performance.

Therefore, internal parasite control may be more important in replacement heifers than in any other class of animal on the operation. In the Northern Plains, treating cattle with parasiticides shortly after or at pasture turnout decreases worm burdens in calves later on in the grazing period. In most instances, treatment of calves with an appropriate internal parasiticide after they have been taken off of pasture (e.g. at the time of weaning or brucellosis vaccination) is appropriate as well, as a means of reducing parasite levels in calves following grazing. The choice of product and timing should be guided by professional veterinary input.

External parasites in the form of biting and often sucking lice can be a detriment to growth during winter on the Northern Plains. Replacement heifers may be treated with external parasiticides at the time of weaning or brucellosis vaccination, but these early treatments rarely clear the animal of all parasites. These "hidden" populations of lice may activate later, necessitating treatment again in mid-winter.

Implant Considerations

Growth implants are often administered to

calves pre-weaning or at weaning as a means of encouraging feed efficiency and growth rate. Oftentimes these lower-potency calf implants contain estrogenic compounds that negatively affect the development of the female reproductive tract. For that purpose, growth implants should not be used in replacement heifers identified at the time of implanting. If only a small proportion of a herd's heifers are destined to become replacements, it has been considered acceptable by some to confidently retain heifers that have only been implanted once with a low-potency implant (e.g. Ralgro® or Synovex-C®). In general, however, growth implants should be avoided in heifers retained as replacements.

Health Considerations For Purchased Replacement Heifers

Many cow-calf producers opt to purchase open replacement heifers from outside sources rather than develop them themselves. This process can result in the rapid introduction of new genetics into the herd but it also raises more uncertainties related to health issues.

Pre-purchase Considerations

Purchasers of replacement heifers should learn as much about the health and performance of the source herd as possible. In some cases, serious future health or reproductive issues may be difficult or impossible to detect in an individual heifer, but will be more apparent in the source herd as a whole.

Reproductive Performance of the Source Herd

Purchasers should seek seedstock operations with a long history of good reproductive performance, as measured by pregnancy rates, calving rates, and neonatal calf survivability. These producers are less likely to supply heifers with certain future health problems than are operations that have experienced reproductive "wrecks" in the recent past. Reputable seedstock producers will be transparent about their herd's recent reproductive performance. Assurance that the seedstock producer routinely investigates the causes of abortions and stillbirths – and communicates the results of those investigations – is also valuable.

Health Programs Employed by the Source Herd

For certain diseases, heifer purchasers may have a vested interest in the supplier's disease testing programs. For example, Johne's Disease testing is a part of some seedstock herds' disease testing program. Johne's Disease is a bacterial disease that results in chronic diarrhea, weight loss and death in diseased cattle years following their exposure to the germ. A blood test of an individual purchased heifer is rarely useful. There is a very long lag period between exposure to the bacteria and the point in time when the animal will become positive on a blood test. For that reason, a history of seedstock herd testing for Johne's Disease is more indicative of the risk of an animal developing Johne's Disease than is an individual blood test. Recent herd testing for BVDV persistent infection may also be of interest to heifer purchasers. Detailed information about the seedstock producer's heifer vaccination program is also valuable. Purchasers should inquire about specific products used and the timing of administration. While there may be sufficient time for the purchaser to adequately vaccinate heifers prior to breeding, prior vaccinations – or lack thereof – may dictate vaccine choice and timing post-purchase. For example, producers should be cautious about using an MLV IBRV vaccine in a heifer close to the time of breeding unless she has been previously vaccinated against IBRV. Other vaccinations to take note of would be for reproductive diseases such as BVDV, leptospirosis, and vibriosis.

Because many different vaccine products are available to beef cattle producers, and administration recommendations sometimes change, a very useful communication strategy is that of a vet-to-vet consultation. This simply involves a conversation between the seedstock producer's veterinarian and the purchaser's herd veterinarian. This is best accomplished prior to heifer purchase but can be valuable following the sale as well.

Post-purchase Considerations Segregation

New herd additions should always be segregated from the resident herd for a length of time. Addition of new replacement heifers is no exception.

Purchasers should plan to keep new heifers separated from other resident cattle for 30 to 60 days.

Regardless of health status, new animals may introduce new infectious disease agents, or slightly different strains of agents that may already exist in the resident herd. When the resident herd has no previous exposure to these germs, clinical illness could result. The segregation period allows time for new animals to overcome transport and social stresses that result in increased shedding of disease agents.

A segregation facility should be located as far away as feasible from resident cattle. Minimally, there should be no nose-to-nose contact between new and resident animals, and longer distances are more optimal. Equipment and vehicles should not be shared between new and resident animals, and care should be taken that runoff from the isolation facility does not flow into resident cattle areas.

Vaccination Considerations

Depending on when heifers are purchased, the segregation period may be an appropriate time to administer vaccines. The vaccination program for purchased replacement heifers should take into account: the vaccination program employed for the resident herd, the need for heifers to receive vaccine boosters when appropriate, and prior vaccinations given by the seedstock supplier. Eventually, the vaccination status for purchased heifers should become matched with that of the resident breeding herd. Specific vaccination considerations for replacement beef heifers have been outlined in the previous sections, but any vaccination program should be designed and implemented with professional veterinary guidance.

Disease Testing Considerations

As previously mentioned, there are pitfalls present with testing programs for certain infectious diseases. For some (e.g. Johne's Disease and leptospirosis), individual testing procedures are insensitive at this stage of development and do not yield useful results. For other diseases, (e.g. IBR), exposures are so common that testing is not advisable, either.

Although not prevalent in replacement-age heifers, one special disease circumstance warrants

consideration for testing incoming heifers. Cattle that are persistently infected with BVDV will excrete large amounts of BVDV throughout their lives, serving as a reservoir of infection for all cattle they encounter. Identification of BVDV persistently infected individuals is very feasible and can be accomplished by sending an ear-notch sample to a veterinary diagnostic laboratory for testing. Some seedstock producers test animals prior to sale. Otherwise, the segregation period is an ideal time period to test new heifers. Replacement heifers should be tested before they enter the breeding herd. If replacement heifers are pregnant, their offspring should be tested prior to entering the herd. Persistently infected animals should be removed from the herd once identified.

Parasite Control and other Treatments

Depending on the time of year and previous treatments, the segregation period may be a good time to apply deworming treatments and to control external parasites. Veterinarians may also recommend antibiotic treatments for incoming animals. For example, in some parts of the US an injection of long-acting tetracycline upon arrival may be warranted for the elimination of the carrier state of leptospirosis.

Summary

Since the future success of a replacement heifer depends on optimal growth and development, health programs for replacement heifers should begin early in life. Endemic diseases such as neonatal diarrhea and bovine respiratory disease have a detrimental effect on calf growth and future reproductive performance. As a replacement heifer ages, disease prevention and vaccination programs more tailored to reproduction will be necessary. Purchasing replacement heifers brings with it the added risk of introducing new infectious disease agents into a herd, but knowledge of the source herd's reproductive performance, vaccination, and disease testing records will help give a producer confidence that the newly purchased heifer will be a productive member of the breeding herd for years to come.

References

- Collins, M. T., I. A. Gardner, F. B. Garry, A. J. Roussel, S. J. Wells. 2006. Consensus recommendations on diagnostic testing for the detection of paratuberculosis in cattle in the United States. *J. Am. Vet. Med. Assn.* 229:1913.
- Daly, R. 2012. Management considerations for reducing infectious reproductive diseases. In: *Proceedings, Applied Reproductive Strategies in Beef Cattle*, Sioux Falls, SD. 285-298.
- Hancock, R. F., G. H. Deutscher, M. K. Nielsen, and D. J. Colburn. 1994. Effects of Synovex C implants on growth rate, pelvic area, reproduction, and calving performance of replacement heifers. *J. Anim. Sci.* 72:292.
- Perry, G. A., A. D. Zimmerman, R. F. Daly, R. E. Buterbaugh, J. Rhoades, D. Scholz, A. Harmon, and C. C. Chase. 2013. The effects of vaccination on serum hormone concentrations and conception rates in synchronized naive beef heifers. *Theriogenology.* 79:200.
- Pinchak, W. E., D. R. Tolleson, M. McCloy, L. J. Hunt, R. J. Gill, R. J. Ansley, and S. J. Bevers. 2004. Morbidity effects on productivity and profitability of stocker cattle grazing in the Southern Plains, *J. Anim. Sci.* 82:2773.
- Ragan, V. E. 2002. The Animal and Plant Health Inspection Service (APHIS) brucellosis eradication program in the United States, *Vet. Microbiol.* 90:11.
- Stromberg B. E., R. J. Vathauer, J. C. Schlotthauer, G. H. Myers, D. L. Haggard, V. L. King, and H. Hanke. 1997. Production response following strategic parasite control in a beef cow-calf. *Vet. Parasitol.* 68:315.