



# Vet Call

► by **Bob Larson**, professor of production medicine, Kansas State University

## Preconditioning programs reduce risk of BRD

*It has been well-established that cattle that become sick due to bovine respiratory disease (BRD) while they are in a feedlot are likely to have reduced gain and carcass performance compared to cattle that remain healthy. And we know that calves that are castrated and dehorned, trucked, commingled with new penmates, and given a completely new diet — all near the time of weaning, are at high risk for BRD.*

### Preparing calves

The concept of preconditioning feeder calves was first introduced in the mid-1960s as an effort to prepare calves for the feedlot before they leave the farm or ranch of origin. Preconditioning is a theoretically sound concept, and programs with various requirements for vaccine and dewormer use, timing of weaning, timing of castration and dehorning, and exposure to grain-based diets have been developed and promoted by state cattlemen's groups; university extension; veterinary groups; and manufacturers of cattle feeds, vaccines, dewormers and other products. However, to date, preconditioning is often not practiced.

### The disease complex

Bovine respiratory disease is also known as BRD, pneumonia, undifferentiated bovine respiratory disease and a few other names. A number of factors combine to cause most cases of BRD. These factors are stress (shipment, mixing with new cattle and diet change), viral infection and bacterial infection.

BRD is generally considered to be a disease of feedlot cattle that are trucked to a feeding facility, commingled with new animals and exposed to new feed and water sources. Age is also a factor, with recently weaned calves and lightweight stocker calves having greater sickness and death risk than yearling cattle.

A number of viruses and bacteria have been associated with BRD. In healthy cattle, exposure to any one of these pathogens (germs) would not be likely to cause disease. Interactions among the pathogens and depression of the immune system due to environmental, management or nutritional stress seem to be necessary to cause BRD. Environmental stressors include heat or cold stress, dust and mud. Dehydration, exhaustion, rough handling and mixing cattle into new social groups are examples of management stressors. Failure to provide adequate water, energy, protein or

minerals causes nutritional stress.

Infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD) and parainfluenza-3 virus (PI<sub>3</sub>) are viruses known to damage the lining of the respiratory tract, which causes inflammation, damages the lung's ability to clear other organisms and allows suitable sites for bacterial replication.

In general, bacteria do not cause BRD in healthy, unstressed cattle. Damage to the lining of the lung and immune suppression is required for bacteria to invade the lung and cause pneumonia. *Mannheimia haemolytica* is the most commonly isolated bacterial agent in fatal cases of BRD. *Pasteurella multocida* is also isolated from fatal BRD cases. Both of these bacteria are normally found in the upper respiratory tract and are able to invade the lung only if defense mechanisms break down. *Haemophilus somnus* has been reported to cause fatal BRD in some areas, and *Mycoplasma* and other bacteria are isolated from some cases of BRD.

### Preventing respiratory disease

Preconditioning programs aim to reduce the number of stressful situations that a feeder calf has to deal with as it is moved from the ranch of origin to the feedlot. Trucking and exposure to new animals is unavoidable in most situations, but other known stresses can be managed. Castration and dehorning have been shown to severely decrease feed intake and gain and increase the risk of disease when

done at the feedlot. If these stresses can be done earlier in life (<2-4 months of age), the negative effects are greatly reduced.

Rapid acclimation to a grain-based diet and good feed intake soon after arrival are associated with cattle that stay healthy in a feedlot. Researchers at Oklahoma State University and Utah State University have suggested that rapid acceptance of a feedlot ration depends more on recognition of the diet than on whether the rumen has adapted to the new diet. Regardless of the specific benefit, most preconditioning programs require a period of exposure to a grain-based

diet, with or without weaning. Weaning is considered by many cattle health experts to be a stressful event even though calves are generally only receiving a small percentage of their nutrient needs via their dam's milk by the time they are weaned. Therefore, weaning the calves well before trucking and commingling allows the cattle to handle multiple stressors better.

Because viral diseases such as IBR (infectious bovine rhinotracheitis) and BVD (bovine viral diarrhea) are associated with BRD, vaccination programs to decrease the risk of infection with these viruses are key components

of preconditioning programs. The challenge in developing an immunization program is to select the correct vaccines and to deliver them in the best fashion and at the correct times to create a response that will protect the herd.

### Cost of preconditioning programs

Adding management such as dehorning and castration, vaccinating, weaning and starting on a grain-based diet are designed to reduce the risk of disease once an animal has left the ranch of origin, but these activities will increase costs for cow-calf producers. In order to benefit from these expenditures, producers must increase the income they receive for their calves (price × pounds).

Reports have indicated that preconditioned calves routinely receive a higher price than similar calves that have not been preconditioned, but in some situations, the price is only slightly higher. At other times, there is a substantial price premium for preconditioned calves. Because income

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includes not only the price received, but also the total weight sold and costs incurred, producers considering a preconditioning program should consider the issues of cost of weight gain and value of weight gain.

### **Adding value during preconditioning**

Some cow-calf producers background or graze weaned calves anywhere from 30 days to 6 months before selling them. Before determining the economic risks and rewards of such a program, several factors, including the marketing method and timing, cyclical market fluctuations, fixed costs (overhead), variable costs (primarily feed), and the goals of the producer should be considered.

Cost of each pound of weight gain is primarily determined by the cost of feed and the number of pounds that can be gained each day. The lowest cost of gain generally occurs with the greatest gain.

To maximize gross income, the cattle should be marketed at a weight and time of year that historically returns a high value per head. Age and average daily gain determine the weight of calves at any predetermined date. By considering body weight and historic market trends, you can predict the average daily gain that has the greatest potential to return the highest gross income.

The real question, however, is not what is the least expensive cost of gain, or the greatest gross income for pounds sold, but a combination of these two values to determine the net value of each pound of gain calculated as the gross costs subtracted from the gross income divided by the pounds of gain. The optimum average daily gain will result in the highest value of gain.

### **Obstacles to preconditioning**

Many cow-calf producers are reluctant to retain ownership of calves during the postweaning bawling period; instead, they prefer to sell calves the day of weaning. This may be due to lack of facilities and labor necessary to keep weaned calves on the farm, or from a reluctance to bear the health risks for postweaning calves. In some areas of the country, raised or local feedstuffs are not available at a price that allows low cost of gain. And, some producers do not anticipate a price reward for preconditioning that will offset their expenses.

These obstacles are legitimate reasons that some producers should not precondition their calves. To overcome these obstacles, producers must be able to utilize cost-effective weaning, working, and feeding facilities, obtain feed at a competitive cost, grow the calves at a high enough rate of gain to allow a low cost of gain, and sell the calves in marketing channels and to buyers that reward preconditioning.

### **Summary**

The value of healthy feeder calves that will stay healthy in the feedlot is well-established. Participation in preconditioning programs is likely to improve feedlot cattle health because of known disease risk factors such as castration and dehorning at feedlot arrival, low feed intake early in the feeding period, and when infection with viral diseases such as IBR and BVD are addressed.

However, because calves that are not preconditioned can perform well from a health standpoint, preconditioned calves do not always have better health and growth performance than nonpreconditioned

calves. Cow-calf producers who can integrate a preconditioning program into a strategy that optimizes calving season, weaning date, cost of gain during a postweaning growing period, sale date, and a marketing plan to target buyers that value his/her product, are likely to maximize the benefits of preconditioning.



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